GEOGRAPHY & INDUSTRY

The EDISON ELECTRIC INSTITUTE BULLETIN

September 1953

SEP 28 1953

The Skills of Management
Ralph M. Besse

Utility Executive Objectives
W. E. Wood

People Are Our Business
Allen King

Importance of Good Employee Relations
H. P. Taylor

Engineer and Accountant Solve a Technical Problem
E. Devere Cowles

Mysterious Case of Section 3

ublished Monthly by Edison Electric Institute

ELECTRICAL RESEARCH STATISTICS
THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

May, 1952-1953

SOURCE AND DISPOSAL OF ENERGY—MONTH OF MAY

	1953	1952	%
GENERATION* (Net)			
By Fuel Burning Plants	25,694,538,000	22,132,019,000	+16.1
By Water Power Plants	10,287,753,000	9,692,472,000	+ 6.1
Total Generation	**35,982,291,000**	**31,824,491,000**	**+13.1**
Add—Net Imports Over International Boundaries	164,493,000	212,391,000	−22.6
Less—Company Use	122,077,000	106,150,000	+15.0
Less—Energy Used by Producer	815,394,000	741,554,000	+10.0
Net Energy for Distribution	**35,209,313,000**	**31,189,178,000**	**+12.9**
Lost and Unaccounted for	4,217,947,000	3,962,399,000	+ 6.4
Sales to Ultimate Customers	**30,991,366,000**	**27,226,779,000**	**+13.8**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of May 31			
Residential or Domestic	41,156,196	39,768,191	+ 3.5
Rural (Distinct Rural Rates)	1,607,033	1,679,572	− 4.3
Commercial or Industrial:			
Small Light and Power	5,672,343	5,573,725	+ 1.8
Large Light and Power	262,631	249,722	+ 5.2
Other Customers	157,818	164,725	− 4.2
Total Ultimate Customers	**48,856,021**	**47,435,936**	**+ 3.0**
KILOWATTHOUR SALES—During Month of May			
Residential or Domestic	7,613,948,000	6,669,050,000	+14.2
Rural (Distinct Rural Rates)	809,030,000	638,992,000	+26.6
Commercial or Industrial:			
Small Light and Power	5,356,230,000	4,800,364,000	+11.6
Large Light and Power	15,748,932,000	13,694,461,000	+15.0
Street and Highway Lighting	271,963,000	249,227,000	+ 9.1
Other Public Authorities	726,825,000	691,052,000	+ 5.2
Railways and Railroads:			
Street and Interurban Railways	228,424,000	252,996,000	− 9.7
Electrified Railroads	183,380,000	190,569,000	− 3.8
Interdepartmental	52,634,000	40,068,000	+31.4
Total to Ultimate Customers	**30,991,366,000**	**27,226,779,000**	**+13.8**
Revenue from Ultimate Customers	**$549,247,000**	**$486,402,900**	**+12.9**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—For 12 months ended May 31			
Kilowatthours per Customer	2,241	2,079	+ 7.8
Average Annual Bill	$61.85	$57.80	+ 7.0
Revenue per Kilowatthour	2.76¢	2.78¢	− 0.7

* By Courtesy of the Federal Power Commission.

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The advancement in the public service of the art of producing, transmitting, and distributing electricity and the promotion of scientific research in such field.

The ascertainment and making available to the members and the public of factual information, data, and statistics relating to the electric industry.

To aid its operating company members to generate and sell electric energy at the lowest possible price commensurate with safe and adequate service, giving due regard to the interests of consumer, investor, and employee.

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The EDISON ELECTRIC INSTITUTE BULLETIN

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CONVENTIONS AND MEETINGS

1953

SEPTEMBER

1 PIP Inter-Regional Committee, Blackstone Hotel, Chicago, Ill.
3- 4 EEI Commercial Sales Section Committees, EEI Headquarters, New York, N. Y.
14-18 IES National Technical Conference, Commodore Hotel, New York, N. Y.
17-18 EEI Industrial Sales Methods and Development Committee, EEI Headquarters, New York, N. Y.
17-18 EEI Competitive Service Committee, EEI Headquarters, New York, N. Y.
17-18 EEI General Power and Heating Committee, EEI Headquarters, New York, N. Y.
17-20 Public Utilities Association of Virginias' Annual Meeting, Greenbrier, White Sulphur Springs, W. Va.
18-19 Maryland Utilities Association Fall Conference, Cavalier Hotel, Virginia Beach, Va.
20-23 Rocky Mountain Electric Association 50th Annual Fall Convention, Broadmoor Hotel, Colorado Springs, Colo.
20-26 NARUC Convention, Hotel Roosevelt, New York, N. Y.
21-22 Missouri Valley Electric Association Accounting Conference, President Hotel, Kansas City, Mo.
21-22 EEI Accident Prevention Committee, Radisson Hotel, Minneapolis, Minn.
21-26 International Association Electrical Inspectors, Silver Jubilee Meeting, Edgewater Beach Hotel, Chicago, Ill.
22 EEI Purchasing and Stores Executive Committee, EEI Headquarters, New York, N. Y.
24 PIP West North Central Region, River Inn Hotel, Fergus Falls, Minn.
25 PIP East North Central Region, Columbus, Ohio
27-30 Controllers Institute of America, Annual Meeting, Hotel Statler, Boston, Mass.
28-29 EEI Residential Promotion Committee, EEI Headquarters, New York, N. Y.
30 PIP Mid-Atlantic Region, Baltimore, Md.

OCTOBER

1- 2 ECAP Copy Group Meeting, N. W. Ayer Headquarters, New York, N. Y.
1- 2 PEA Accident Prevention Committee, Roosevelt Hotel, Pittsburgh, Pa.
1- 2 Southeastern Electric Exchange, Engineering and Operation Section Conference, The Carolina, Pinehurst, N. C.
1- 2 PEA Relay Committee, Fall Meeting, Irem Temple Country Club, Dallas, Pa.
1- 2 EEI-AGA Taxation Accounting Committees, Sheraton Park Hotel, Washington, D. C.
5- 6 PEA System Planning Committee, Bedford Springs Hotel, Bedford, Pa.
5- 6 EEI Prime Movers Committee, Statler Hotel, Detroit, Mich.
7- 9 EEI-AGA Electronics Seminar, Hotel Commodore, New York, N. Y.
7- 9 Indiana Electric Association Annual Convention, French Lick Springs Hotel, French Lick, Ind.
7- 9 Missouri Valley Electric Association Sales and Rural Conference, President Hotel, Kansas City, Mo.
8- 9 PEA Hydraulic Power Committee, Skytop Lodge, Skytop, Pa.
8- 9 PEA Electrical Equipment Committee jointly with PEA Transmission and Distribution Committee, Abraham Lincoln Hotel, Reading, Pa.
8- 9 EEI Transmission and Distribution Committee, Hotel Nicollet, Minneapolis, Minn.

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OCTOBER

12-13 Iowa Utilities Association Management Conference, Hotel Fort Des Moines, Des Moines, Iowa.
12-14 EEI Industrial Relations Committee Annual Round-Table Conference, Sheraton Hotel, Chicago, Ill.
15-16 PEA Motor Transportation Committee, Yorktowne Hotel, York, Pa.
15-16 Southeastern Electric Exchange Accounting Section Conference, Battery Park Hotel, Asheville, N. C.
19-20 PEA Business Development Section, Bedford Springs Hotel, Bedford, Pa.
19-20 PEA Prime Movers Committee Fall Meeting, Hotel Morgan, Morgantown, W. Va.
19-21 ASA 4th National Standardization Conference and 35th Annual Meeting, Waldorf-Astoria, New York, N. Y.
19-21 EEI Meter and Service Committee, William Penn Hotel, Pittsburgh, Pa.
19-23 ASCE Annual Convention, Hotel Statler, New York, N. Y.
21 PIP Steering Committee, Edgewater Beach Hotel, Chicago, Ill.
22 EEI Commercial Division General Committee, Hotel Commodore, New York, N. Y.
22 Oklahoma Utilities Association, Electric Light and Power Division, Eastern District, Vinita, Okla.
22-23 PEA Meter Committee, Brunswick Hotel, Lancaster, Pa.
22-23 PIP Workshop, Edgewater Beach Hotel, Chicago, Ill.
23 Oklahoma Utilities Association, Electric Light and Power Division, Western District, Norman, Okla.
26-28 AGA Convention, Statler Hotel, St. Louis, Mo.

NOVEMBER

2- 3 EEI Electrical Equipment Committee, Jung Hotel, New Orleans, La.
5- 6 PEA Systems Operations Committee, Castleton Hotel, New Castle, Pa.
11-13 Wisconsin Utilities Association, Electric and Gas Section, Hotel Schroeder, Milwaukee, Wis.
12-13 EEI Accounting Executive Committee, Edgewater Beach Hotel, Chicago, Ill.
19-20 New Jersey Utilities Association Annual Meeting, Seaview Country Club, Atlantic City, N. J.
19-20 Pacific Coast Electrical Association Annual Hawaiian Conference, Honolulu, T. H.
19-21 Southeastern Electric Exchange, General Sales Conference, Biltmore Hotel, Atlanta, Ga.
30-Dec. 1 EEI-AGA General Accounting Committees, Jung Hotel, New Orleans, La.

1954

JANUARY

18-22 CEA Eastern Division Meeting, Quebec, Que.

FEBRUARY

4- 5 Missouri Valley Electric Association, Industrial and Commercial Sales Conference, President Hotel, Kansas City, Mo.
9-10 EEI Transmission and Distribution Committee, Hotel Cleveland, Cleveland, Ohio
15-19 ASCE Atlanta Convention, Biltmore Hotel, Atlanta, Ga.

MARCH

1- 5 CEA Western Division, Winnipeg, Man.
22-24 Southeastern Electric Exchange 21st Annual Meeting, Boca Raton Hotel, Boca Raton, Fla.
25-26 Oklahoma Utilities Association Annual Convention, Biltmore Hotel, Oklahoma City, Okla.

The EDISON ELECTRIC INSTITUTE
BULLETIN

An Outline of the Skills of Management

Ralph M. Besse
Executive Vice President, The Cleveland Electric Illuminating Company

Presented at the Summer General Meeting of the American Institute of Electrical Engineers, Atlantic City, N. J., June 16, 1953

IN modern enterprise the more successful a man is in the application of his technical specialty, the less he is apt to use it. This paradox arises from the fact that promotion is largely based on success in doing a good job. Thus, the engineer who does the best job in applying his engineering skills will be the one most likely to receive a promotion.

But, as soon as the engineer is promoted, he assumes the responsibility for managing other people who are exercising the technical skill which gained him his promotion. The more promotions he receives, the more time he must devote to the management of other people. Likewise, the more promotions he receives, the farther away he gets from the application of his own technical skill and the more involved he becomes in the supervision of people who have different technical skills.

Thus it is that in modern enterprise the more successful a man is in the application of his technical specialty, the less he is apt to use it.

The converse of this proposition is that the requirement for broad management skills becomes increasingly greater as the use of a technical skill becomes increasingly smaller.

This is a relatively new concept. The traditional requirements of management were hard work, frugality, mechanical invention, and the capacity to exploit resources. These are still substantially involved in management, but the ever broadening facets of the management problem require an ever increasing attention to the special art of managing people.

This arises from many circumstances, complex and unrelated. Our people are better educated than they used to be. They have more leisure, more time to think about their affairs, more and faster communication, and less concern with the bare necessities of life. They can no longer be driven to work.

The size of our enterprises is startlingly different from their size a generation ago. Small, unheard of segments of modern corporations are bigger than their entire parent corporation was 40 years ago.

The complexity of modern enterprise calls for many different skills: the skills of living under and dealing with a government; negotiating with labor unions; predicting money markets; assuring world sources of materials; minimizing taxation; and analyzing sales media. These require talents and preparation which the buggy-whip business never knew.

Finally, the objectives of a modern corporation have added to the profit motive some broad base philosophies of service and citizenship which call for management skills and attitudes wholly additional to technical capacity.

All of this seems pretty forbidding to the person whose academic training and early experience were combined to perfect a technical skill of diminishing importance. But it need not be forbidding. The skills of management are known. They have been tried, tested, refined, and recorded by many people in many circumstances. They are available to anyone who has the intelligence to understand the printed word—if he has the energy and the resolution to read it. Not only are the principles spelled out; the case studies from which they were derived accompany them. Nothing but lack of purpose stands between any manager and the best concepts of modern successful management.

What is management? An adequate discussion of the skills of management involves some basic concept of the term "management." Unfortunately, there is no simple, adequate definition of the word.

In terms of people, management is usually defined as the direction of the efforts of a group of people toward the attainment of the objectives of an enterprise.

In terms of action, management is the process of planning before action, review during action, and analysis after action.

In terms of procedure, management is the determination of what is to be done, who is to do it, how well it is done, and how it can be done better.

Books have been written on the subject but these elemental concepts are adequate for a general discussion.

There are four broad gauge skills of management applicable to all enterprise. They are:

1. The ability to so direct the enterprise that it will render increasing service to its customers;
2. The ability to make the enterprise profitable;
3. The ability to obtain the full participation of employees in the enterprise; and
4. The ability to make people adaptable to change.

These broad base skills are not stated in the order of their importance. They are like the relative im-

portance of the lungs, the heart, and the liver—life cannot go on without any one of them.

The distinguishing characteristic of American achievement is the constant increase in standard of living which has resulted from our unique combination of political, social, and economic freedom. The economic freedom we have enjoyed will be maintained only if standards of living continue to increase. Standards of living will continue to increase only if our enterprises increase their services to their customers. It is as simple as that. We either continue to do an ever and ever better job for the people we serve or the enterprise which we now manage will be subjected to different management. This is perhaps more of an attitude than a skill. Whatever its name, its importance is vital both to the progress of managers and to the health of enterprises. It is the skill the customers demand.

Making a Profit

The second great skill of management is the ability to make a profit. It is still the core of all management requirements. The existence of any business depends on making a profit. It is the skill the owner of the enterprise demands.

I am indebted to Lawrence Appley of the American Management Association for his definition of a profit. He says that profit is the difference between the amount of goods and services which an enterprise consumes and the amount of goods and services which it produces. Thus, whether you are talking about a charitable organization or a business enterprise, neither can continue its existence unless it produces more than it consumes, and that is profit.

A great many people in management are so concerned with the collateral requirements of the particular segment of the enterprise for which they are responsible that they lose sight of the fact that one of the prime requirements of management responsibility in every element of a business is to contribute to the profit of the enterprise.

Someone from McKinsey and Co. once said: "The chief headache of many large companies is too many executives and not enough businessmen. What's the difference? A businessman makes profits."

It is not enough merely to make "some" profit. It must be an adequate profit. Anyone in management who does not understand the need for profit and who does not have some measure of the adequacy of the profit required for his business or his part of the business is not an adequate member of management.

In this connection, management has the social responsibility to advocate the ethics of profit. Profit is one of the few incentives that have both improved the economic lot of man and preserved his freedom. Those who attack the ethics of profit have so far offered no alternative capable of yielding this multiple fruit. The skill of making profits is the essence of management requirements.

Modern enterprise is both too intricate and too big for either one-man decision or one-man performance. Successful operation of an enterprise requires a division of labor and a division of responsibility which can be effective only when those to whom the various parts of the operation are assigned fully participate in the whole range of management skills applicable to their area of responsibility.

To perfect the skill of obtaining participation requires both a willingness and a capacity to delegate, to coordinate, to communicate, and above all to believe in people.

There is not enough time for the geniuses to do all of the work. They are compelled by the necessity of the case to rely on the rest of us, even if we were to conclude that their own peculiar contribution to the enterprise could not be duplicated. Participation of all employees is a must. And the skill of obtaining such participation, like the other broad base skills of management, is involved in the exercise of each talent the manager possesses.

The fourth broad base skill of management is the ability to make people adaptable to change. It includes, of course, one's own capacity to accept and propose changes, and it applies to every element of business. Whether we are talking about the product we make, the service we render, the location of our business, the form of our organization, the equipment we use, the methods we apply, the organization we have provided, the people we have assigned, or any other element or characteristic of our business, the one thing of which we can all be certain is that yesterday's plan must be changed for tomorrow.

The metamorphosis of the Ford Motor Co. is the outstanding case study in illustration of this principle. If you will look at *Tide* magazine for May 9, 1953, you will find the whole story.

The concept is simple—in a dynamic era virtually everything for which management is responsible either changes for the better or it changes for the worse. The open mind and the inquiring attitude are, therefore, fundamental to the application of all other specific skills and tools of management.

Specific Skills of Management

The specific skills of management can be broadly classified as planning and controlling or listed in a detail that would run to several scores of items. In order to bring them within some practical compass, let us consider six classifications, along with some specific tools for their application. The skills here selected for discussion are:

1. Planning.
2. Organizing.
3. Controlling.
4. Developing people.
5. Communicating.
6. Self-analysis.

1. *The Skill of Planning.*

The skill of planning underlies all of the other skills of management and is related to virtually every segment of the operation of an enterprise. It includes the formation of objectives, the determination of the policy and procedure necessary to achieve them, and the assignment of responsibility to do the job.

The essential features of an analytical plan are these (and for substantial parts of this outline I am indebted to the American Management Association):

a. *Clarify the problem.*

A great many management mistakes are made at all levels because of failure to clarify and sharply define problems before people are assigned to work on them. Thousands of man-hours are wasted for lack of clarification of problems, and many wrong answers are traceable to a careless beginning in the planning stage.

b. *Get the facts.*

This is so fundamental that it seems superfluous to mention it; but lack of skill in getting facts is responsible for as many failures as any other single cause.

Rule one in getting the facts is to check with everyone concerned.

Rule two is to get them as directly as possible in order to eliminate error, omission, and coloring in transmission.

Rule three is to consider all possible sources for information.

Rule four is to get the facts as soon as possible after their occurrence.

Rule five is to present them in time for the decision even though they are incomplete.

Rule six is to consider collateral situations that may be indirectly involved.

Rule seven is to consider the time and cost involved in obtaining the facts, in relation to the value or importance of the purpose for which they are sought.

Rule eight is to have more than one person work on the facts if the importance of the problem is great.

c. *Analyze the facts.*

The facts must be sifted, combined, and related so as to throw light on the choice of action to be taken. In other words, separate the wheat from the chaff. This, of course, requires intelligence, judgment, and experience over and above derived skills.

d. *Consider the alternatives.*

This applies to personnel as well as to operations. It is especially important in capital investment planning. Unless you have alternatives, you are not master of the situation. A good general maneuvers so that he can pick his own battlefield. Don't overlook improvement of the present system as an alternative. A new plan is apt to be presented on the basis of its maximum and, compared with an existing plan, at its minimum.

e. *Decide on action.*

There is no real plan until an authoritative decision is reached. But don't make binding decisions until you have to—today's plan may call for action next April. Keep flexible enough to change the plan of action before starting next April, because the controlling facts may change or improved alternatives may be available by then.

f. *Arrange for execution.*

The final step is to advise everyone affected by the plan and the program for its execution. Be very sure the people who are to execute the plan fully understand it, including the why of action as well as the what, where, and when. Failure at the action stage means futility at the planning stage.

Issue clear, complete, and clean-cut instructions to the people who are to do the job.

The elements of a plan are but one facet of the art or skill of planning —much more learning is available, and valuable, for everyone who turns to the library or the seminar for help. In passing, it should be noted that one of the skills of management is the cultivated inclination to take this turn.

2. *The Skill of Organizing.*

This is a specialized planning skill. Lynn Urwick has said that organization planning is the process of defining and grouping the activities of the enterprise so that they may be most logically assigned and effectively executed.

In the Management Course of the American Management Association, discussion of this single skill occupies a full week. Many volumes have been written on it, and among the best are those by Alvin Brown, Ernest Dale, and Lynn Urwick.

Running all through the problems of organization are certain guiding principles which have been outlined by these writers and many others. A manager is required both to know them and to know how to apply them.

a. *The principle of the objective.*

Mr. Urwick has said, "Every organization and every part of every organization must be an expression of the purpose of the undertaking concerned or it is meaningless and therefore redundant." To be of maximum effect, the objectives must be written for both the organization and its multiple parts.

b. *The principle of functional grouping.*

The activities of every member of any organized group and of every group of members should be carefully stated in order that like functions may be combined for coordination and individuals be assigned to specialized areas for maximum efficiency. Without a careful written description of functions, positions, duties, responsibilities, and relationships, the inefficiency of overlay and omission is apt not to be avoided and coordination becomes increasingly difficult.

c. *The principle of coordination.*

"The purpose of organizing per se," says Mr. Urwick, "as distinguished from the purpose of the undertaking, is to facilitate coordination; unity of effort."

Coordination should be a job responsibility. The tendency of too many managers is to leave coordination to common superiors—a slow and costly method of operation. The primary responsibility for coordination should rest with the person who has a problem that needs coordinating. The superior's aid should be sought only when the direct approach to coordination fails. The development of this skill and the habit of coordination, of course, call for understanding human relations as well as a thorough knowledge of the functions being coordinated.

d. *The principle of authority.*

In every organized group there must be well-selected control points in which responsibility for functional decision is placed. There must be a clear line of authority from the top person in the enterprise and from every control point to every individual in the group.

Those who are given this authority must accept the responsibility for the acts of their subordinates in carrying out the authority. Authority and responsibility must always be in balance.

e. *The principle of span.*

No organization plan is complete until every management job has been examined to determine the proper number of people to be supervised. There is no formula for general application. The complexity of functions, the geography involved, the nature of the people su-

pervised, the capacity of the supervisor and many other factors are involved. Too few in the span means too little delegation of authority, too much expense, and too many layers. Too many in the span means there will be no supervision. The real skill involved lies in the analysis of the particular case to obtain the best arrangement in the circumstances involved.

f. *The principle of levels.*

An organization should have as few levels as possible in the light of the requirements to carry out effectively the functions of the enterprise. Too many levels are costly, interrupt communications, prevent coordination, and delay action. Because of this principle, the so-called one-over-one-type of organization is rarely justified.

g. *The principle of balance.*

Mr. Urwick says, "It is essential that the various units of an organization should be kept in balance."

He means balance as to size and importance, authority, and responsibility. Comparable people at comparable levels work better together and challenge each other to better results. A proper division of functions in a major enterprise is a balanced division. A part of the skill lies in keeping it balanced, as well as in establishing the balance.

h. *The principle of organized continuity.*

An enterprise should be organized to review organization and reorganization continuously. Specific provision should be made for it or it may not be done. Corporations, theoretically, go on forever and change certainly goes on forever. Both concepts require organization skill on a continuing basis.

A good statement of essentially the same principles has been made by Dr. Hopf of the Hopf Institute of Management. He has stated the following guides to improvement in management:

"1. Establish the fewest number of levels of the structure essential to sound operation.
"2. Place authority as closely as possible to the point where action originates.
"3. Decentralize operations whenever territorial considerations become of importance.
"4. Avoid overlapping of functions, but always bring related work together under one and the same control.
"5. Distinguish clearly among the several zones which comprise the organizational structure, i.e., Administration, Management, and Operation.
"6. Transform detailed information as quickly as possible into control information as it moves upward in the organizational structure.
"7. Exhaust individual channels of performance before having recourse to time-consuming group action.
"8. Establish sensible spans of control which will fully take account of the differing personal equations of individual executives.
"9. Effect the widest possible application of the principle of separating planning from performance.
"10. Always have a definite goal in mind, and on paper, in terms of which progress made in improving organizational conditions may be periodically appraised."

Some of the problems of organization planning should be noted because the skill of organizing is unavoidably involved in the problems which arise from organizing. Ernest Dale has outlined this subject with great insight. He points out the following problems which normally affect the over-all job of organization planning:

First, there is the problem of personalities. Organization planning must be done in such a way as to preserve both the capabilities of individuals involved and their modification. This is not easy and in many situations not entirely possible. While the acceptance of the individuals involved must be obtained, if at all possible, the good of the enterprise must take precedence over the pleasure of the individual.

A second problem encountered in organization planning is the overburdened executive. He is normally living proof of the need of better organization planning. He vitally complicates the problem by his unwillingness to delegate.

A third type of problem is that which arises from confusion in the relationship between staff and line. Industrial fumbling in this area has reached epidemic proportions. Staff activity is one of the most costly elements of business operation. Properly controlled, of course, it is one of the most productive elements. So the skill that needs to be developed is control. It is basically related to the skill of organization.

The problem of committees is another recurring one. Groups go through cycles first of too many committees and then of too few. It is one of the areas in which much research still needs to be done.

The problem of one-man control also bothers the organization planners. It is probably the rule rather than the exception that organization plans are not strictly followed because here and there throughout a big organization there are men who refuse to abide by the plan. They continue to exercise the controls they formerly had and to make decisions for people who traditionally relied upon them.

Finally, organization planning, which by its nature must be continuous, involves the problem of too many changes. The purpose is to improve an organization not confuse it. Therefore, organization changes must be made in a way that is conducive to stability.

3. *The Skill of Controlling.*

The elements of control were outlined by Joseph Juran at the American Management Association Course as follows:

1. Establish control points.
2. Establish units of measure.
3. Establish a method of measurement.
4. Establish standards of performance.
5. Analyze the difference between actual performance and the standard of performance.
6. Decide what to do about it.

In establishing control points, the basic principle is to identify the perils of the enterprise in order to take the action needed to meet the perils. In selecting control points the purposes to have in mind are twofold:

1. To give warning of the obstacles which lie ahead in order that plans may be made to avoid them;
2. To multiply the effectiveness of

managers by giving them tools to aid in the supervision of an operation without requiring them to know all of the details involved in an operation.

The heart of the skill of control is the standard of performance. Larry Appley has said that standards of performance are statements of conditions that will exist when a job is well done. A standard of performance can be stated for every job, and until it has been stated, management is inadequate because the best basis of control of the operation is missing.

Volumes have been written on this intricate subject which is so directly related to industrial engineering. The standards fall into three classes: historical, that is, past performance; engineering, that is, scientifically computed standards; and market, or comparisons with others.

Effective application of the skill of controlling requires a study of the principles involved; proper planning for control; proper organization for control; and a proper reporting system.

The reporting system is a very vital element in control. It must be accurate, it must be timely, it must be directed to elements which can be effectively controlled, it must have a minimum of detail, it must be clear, it must be concise, and above all it must be thoroughly understood if not prepared by the person whose activity is being controlled.

The real substance of control is performance analysis. The goal of all managers should be to get every manager to analyze his own performance through proper control data. The review of this control data by people higher up in the organization is important, but subordinate to the real purpose of developing the skill in the manager at the lower level to control his own performance.

4. *The Skill of Developing People.*

If we accept the simple definition of management that it is the art of getting things done through people, then the simple method of improving management skill would obviously be improvement in the art of developing people. There are many who think that good management is as simple as this. Perhaps it is. Larry Appley has outlined this subject in the following six steps.

1. Develop a simple outline of the functions and operations to be performed by the person or group of persons involved.
2. Develop a simple statement of the results which will be considered satisfactory (standards of performance).
3. At regular intervals check the actual performance against the standards that have been developed.
4. Make a list of corrective actions necessary to improve performance where such improvement is needed.
5. Select the best sources from which the individual involved can obtain help and information.
6. Provide a time for supplying needed help and information.

All of this can be summarized by simply saying that we should have standards of performance for people, we should appraise their performance in the light of the standards, and we should work directly and frankly with them in order to strengthen their strengths and reduce their weaknesses revealed by the appraisal of their performance.

Included in the skill of developing people is the problem of selecting the means of development which will achieve the best results in the light of the need of the person involved. A great many indirect means of developing people are being applied in industry today, without critical analysis of their value, when a direct medium would be more appropriate and more effective.

The most direct medium of management development is the daily, continuing, constant, coaching of a subordinate by his superior. Simple as this sounds it is not common practice in the management areas. It requires skill that most managers do not have, not because they are incapable of exercising the skill, but because they have never taken the time or trouble to learn it.

There are many other media for developing people, of course. They are discussed in all of the good treatises.

The skills involved in developing people are very great but there is a great body of practical experience available in the literature to help anyone who wants to acquire the skill. The best books on the subject have been written by John W. Riegel, *Executive Development, A Survey of Experience in Fifty American Corporations;* Myles Mace, *The Growth and Development of Executives;* and the American Management Association, *The Development of Executive Talent.*

5. *The Skill of Communication.*

The coordination of business enterprise depends very largely on the skill of the manager in communicating. This requires the following on the part of virtually every manager:

1. The ability to express himself orally in clear, simple, effective language. Oral communication comprises 75 to 90 per cent of all employee communications. This requires training in thinking, in organization of thought, in word use, in techniques, and in group and public presentations.
2. The ability to express himself in writing in clear, simple, effective language.
3. The ability to read rapidly and comprehensively.
4. The ability to conduct an interview.
5. The ability to conduct a conference or meeting.
6. The ability to serve effectively as a chairman of a meeting.
7. The ability to teach.
8. The ability to secure participation in the discussion of problems and the development of plans.

Mr. Lewis, in his book on word power, refers to a reputable survey which concluded that the only common trait of successful executives was the size of their vocabulary. To the very great surprise of the academic world the vocabulary of the average corporate officer in major enterprise exceeds that of the college professor. It has to. The talent of a coordinating officer can be exercised only through the use of words, oral or written.

What is more, the personal opportunity of a manager, at any level, to move on to a higher job is very apt to depend on his ability to give and to receive communication.

Included in this tremendous group of skills is the skill of stimulating communication from those below the manager. Communication upward in an organization is probably more important than communication downward. If the area of policy loses contact with the area of action, both deteriorate.

One of the great skills of communication which should be noted is the skill of audience analysis. Explanations of an income statement, for exexample, need to be stated in entirely different forms, perhaps with different objectives, depending on whether they are prepared for an auditor, a board of directors, the public or employees. Thus, the skill of the manager must be so developed that he will have the capacity both to analyze the objective in the light of the audience and to present his message in the form which will be understood by the audience.

6. *The Skill of Self-Analysis.*

All skills are personal whether they be physical skills, technical skills, or management skills. Therefore, all skills require self-analysis and self-improvement. This means that the intelligent manager must, first, provide some time to analyze his own needs, qualities, and performance, and, second, must make the effort to do something about it.

There are many areas which call for self-analysis and the first one is health. Much expensive training is poured into a manager whether he be first line or top brass. A part of his responsibility is to preserve his health so that his enterprise may be compensated for the training it has given him.

A second important element of self-analysis is the determination by an individual that he is working in the right field for the right company. Lives are ruined and performance impaired by having people in jobs for which they have no aptitude.

The habits of a manager are an important area for self-analysis. Work habits, personality habits, human relations habits, special habits, and all of the others.

Good character is another personal trait that is an absolute requirement for a competent executive. Breadth of interest falls in this same field. The higher an individual moves in an organization the more variant the fields of interest will be which have a direct bearing on his job. Self-analysis should reveal them.

Emotional discipline is another self-imposed and self-developed skill which managers must have. Few can acquire complete control of their emotions in all situations but each can improve such control if he tries to. Tolerance falls in the same group.

Finally, courage is involved. If a policeman's lot is not a happy one, he can take some consolation from the unhappy decisions which managers must make. When the welfare of whole groups and complete enterprises depends on the decision of managers which are adverse to an individual, the proper action must be taken even though the individual involved is a close personal friend, a fine character, and a person of great past contribution. This requires courage, and the courage must be applied with a skill that reduces to the greatest extent possible the damage to the individual involved.

All of these characteristics or personal traits can be revealed by rugged self-analysis—a neglected skill of many managers.

In conclusion, I would like to discuss the greatest management skill of all—the ability to motivate people. It is at once the most difficult and most profitable of all management requirements.

Motivation, although it is the core of leadership, is the most difficult of management skills because it involves both an understanding of people and an understanding of the techniques of handling people. The development of the skill of motivation in American industry lags our technical development by a half century. Great segments of our economy have not yet realized its importance, much less developed its technique.

Most of our school curricula contain no courses in living with people, much less in the higher art of managing them. Most of our college graduates have had no academic training in the subject, and the overwhelming majority of our business people still look upon industrial psychology as an inadequate treatment for eccentrics.

And yet motivation, essentially a psychological process, accounts for nine-tenths of all of the great achievements of all time.

Motivation is the most profitable of all management skills because the average employee, at whatever level you find him in the corporate structure, does only a minor fraction of the things he is capable of doing. We do not tap the major potential of most people. The reason we do not tap it is because we have not acquired adequate skill in motivating them.

How do you motivate people? The first requirement is to believe in people. If you, as a manager, do not think they can plan better, perform better, and accept greater responsibility, it is highly improbable that you will give them the opportunity to do so.

The second great requirement to motivate people is the kind of an example you set. You must have an attitude which appeals to them. You must have the kind of habits which you want them to copy and which achieve the purpose. You must have the kind of character that compels admiration. You must exert the sort of effort you would like them to exert. Leadership in motivation requires performance on the part of the leader.

The third element in motivation is participation. It is safe to say that virtually no one is motivated to unusual achievement who does not responsibly participate in the planning and decisions involved in his problem. Participation calls for challenging problems, delegation of authority, friendly coordination, an atmosphere of acceptance, and an ability to work with people.

The fourth element in motivation is the provision of adequate incentives and rewards for effort. If done well enough, this alone will stimulate tremendous motivation. It is the keystone of our economic, political, and social way of life. It includes opportunity and authority as well as dollars.

The next requirement for motivation is recognition of the achievements of the people involved. As we move farther away from the fear of not having the bare necessities of life essential to our security, we move deeper into the area of psychological requirements. The most important of these is recognition of the importance and excellence of a job well done.

The final element in motivation is the nature of the job itself. People need to have assignments which they are capable of completing. They need to have work which they believe to be both wholesome and important, and they need to know the relationship of their particular assignment to the results and objectives of the whole product or enterprise.

This is the keystone. When we have mastered the skill of motivation, we will have mastered all of the skills of management.

Utility Executive Objectives and Duties

W. E. Wood

Executive Vice President, Virginia Electric and Power Company
Chairman, Southeastern Electric Exchange Course Committee

Extracts from an address before students of the Georg a T ch—Southeastern Electric Exchange Public Utility Executive Course, Georgia Institute of Technology, July 6, 1953.

THE Public Utility Executive Course, sponsored by the Southeastern Electric Exchange and held with the cooperation of the Georgia Institute of Technology, was the first such course ever held in the South. It lasted for four weeks ending July 31 and was attended by 46 management men in electric power companies.

"The purpose of this course," said W. E. Wood, Southeastern Electric Exchange Committee Chairman, in the introduction of the course to registrants at Georgia Tech, "is to help prepare junior utility executives for promotion into top managerial positions." "The successful operation of privately-owned utilities requires great skill and a broad understanding of many complex subjects," he also pointed out in his address. Text of the introductory talk adjoins this box.

For a faculty, SEE's course director, Prof. James W. Sweeney and Mr. Wood, over a period of 18 months, assembled 28 authorities on utility operations. They included industry leaders and professors from other universities. The course consisted of daily lectures and panel discussions on many of the finer points of utility management which helped to increase the executives' skill in policy making and long-range planning. Those taking the course were given ample opportunity during each panel discussion and "bull session" to ask questions about anything they did not understand or with which they disagreed.

THE risk, or equity, capital required by privately-owned utility companies is furnished by their stockholders. These stockholders elect a Board of Directors which, in turn, selects officers to direct their company's affairs. These stockholders, naturally, expect the officers to protect their interest. They will receive little or no return on their investment unless their officers are capable of operating their companies successfully. Efficiency of operation depends upon sound management. Management, to be sound, must understand clearly its objectives, duties, and responsibilities.

The real objective of utility management is to produce, through efficiency of operation, the maximum benefits possible consistent with good service. Under the American private enterprise system, the public, the employees, and the investors have a proper and inherent interest in public utility operations. All three of these groups have a right to expect that these benefits will be distributed equitably among them.

Now, maximum operating efficiency is what might be called a technical goal. Every year it is becoming plainer and plainer to utility managements, and probably also to all industrial and business managements, that *maximum* operating efficiency cannot be achieved unless we have the confidence, respect, and cooperation of both the public and our employees. For lack of a better name, we will call this essential confidence, respect, and cooperation our spiritual goal.

The real objective of utility management and its technical goal are, therefore, identical. This fact, however, in no way minimizes the importance of attaining our spiritual goal, because our ability to reach either goal is interdependent upon our ability to reach the other. Maximum efficiency of operation plainly depends upon the confidence, respect, and cooperation of our employees and the public. We cannot win this confidence, respect, and cooperation unless our operations are reasonably efficient.

Since our real objective is identical with our technical goal, the greater part of this course and, correspondingly, of your time and effort will be devoted to a consideration of those subjects which are the most useful in enabling us to improve our technical results.

Basic Principles

To fulfill our technical requirements, executives must understand, among other things, the principles of:

- good management;
- good engineering;
- economics;
- utility regulation;
- sound financing;
- budgeting;
- long-range forecasting and planning;
- public utility accounting; and
- sound organization.

We must become familiar with the laws—local, state, and national—which affect public utilities.

We are including in this introduction a somewhat detailed discussion of the principles involved in attaining our spiritual goal in order that you might understand better the proper relationship between technical and spiritual requirements.

Some consideration of all these subjects is included in this course. This is a large order for anyone to tackle within a four-week period. Naturally, when you return to your regular duties, you will have to continue to pursue these subjects diligently.

To fulfill our spiritual requirements, reasonable progress in effecting efficiency of operation must have been made and, in addition, we must also have developed a sound utility philosophy. Every utility executive, whether or not he is aware of it, necessarily bases his policy decisions on some business philosophy. Although he may never have clarified in his own mind just what his philosophy is, nevertheless, he has instinctively gathered and holds beliefs which govern his actions. The policies which he adopts will necessarily depend upon these beliefs. It is, therefore, important for top utility executives to develop for themselves a clear-cut business philosophy upon which to base their decisions. Unless they have developed

a clear and specific understanding of what they are trying to accomplish and why, their policies and practices will inevitably be vague and inconsistent. Policies and practices based principally on a philosophy of expediency, which often appears to be the most convenient one, will actually become chaotic.

You will make considerable progress in clarifying your own utility beliefs, if while you are here, you will discuss freely with each other during the "bull sessions" your own philosophic impressions and beliefs.

In order to stimulate your thinking and promote discussion among you, we would like to suggest for your consideration a tentative, but fairly specific public utility philosophy. You need not adopt this tentative philosophy as your own. Every executive has to decide for himself what he really believes. The principles suggested here should be used, rather, as a starting point for your thinking and discussions. They are subject to amendment and improvement. Indeed, if your experience and logic so direct, they may be changed completely. The important thing to remember is that executives cannot fulfill successfully their spiritual requirements until they have developed a sound and specific philosophy upon which to base their policies and decisions. It is hoped that you will find this course more interesting and easier to understand as it becomes clearer to you where you want to go and why.

The Tentative Philosophy

Two fundamentally different economic systems are prevalent today. One of these systems, private enterprise, is based on the principle of individual freedom and responsibility; the other, socialism, subordinates individual liberty to the welfare of the state. Partisans of each are continually striving to conform the world's civilization to the system in which they believe. There can be no question that the kind of civilization which should prevail is that one which will be ultimately the most beneficial to mankind.

Privately-owned and operated utilities are an important part of our private enterprise system. You young men may be presumed to believe that the most beneficial civilization can be developed only through the private enterprise system. What specific philosophy, then, should guide us in order that our private utilities may make the maximum contribution to the welfare and happiness of the nation and thereby warrant the respect and support of our citizens?

Under the private enterprise system, let us repeat, every citizen has an inherent interest in the affairs of public utilities as a member of the public, an employee, or an investor. Many are members of all three groups. The greatest benefits from the operation of private utilities will be derived, of course, (1) when they are being operated most efficiently, (2) when management is securing a reasonable cooperation among these three groups, and (3) when the benefits derived from their operation are being distributed equitably among these groups. The accomplishment of these objectives is a responsibility of management.

Inherent Interests of Groups

Now let us consider briefly what are the respective inherent interests of these three groups.

1. The public — which includes customers—is entitled to receive good service at the lowest reasonable rates.

Service, to be good, must be available throughout our entire service areas; utilities must be ready and willing to meet all of the reasonable service needs of everyone within their service areas; and our service must conform to all customary standards with respect to adequacy, continuity, and availability.

Reasonable rates are those needed to pay all legitimate costs incurred in providing good service including taxes, depreciation, and obsolescence, fair wages and working conditions for employees, and a return on the investment in the utility sufficient to attract all of the new capital necessary to maintain operating efficiency and to provide for the necessary expansion of the system. Whenever our rate structures produce revenues in excess of or below these needs, a rate readjustment is in order. Any management which hopes to gain the confidence and respect of the public must keep the regulatory authorities continuously informed as to whether it is earning more or less than enough to meet these proper needs.

2. Employees are entitled to human treatment, fair wages, and good working conditions.

We have already pointed out that efficiency of operation is a must. Its attainment must be the real objective of management. Without it, the benefits to be distributed among the three groups will be few and small. All three groups have a right to expect management to develop efficiency of operation. Yet, plainly, no utility can expect to attain this efficiency without the whole-hearted cooperation of its employees. We must, therefore, build up the morale of employees in order to secure their cooperation. To build the morale of its employees, management must treat them with understanding, consideration, and fairness; provide fair wages and good working conditions commensurate with reasonable and customary standards; give them the opportunity and encourage them to better their positions with the company; keep them fully and frankly informed about the policies, affairs, and problems of the company; and encourage them to discuss all of these things with the company as well as make suggestions about them. Even if we do all of these things, unless employees respect the principles, policies, and practices of the company and the integrity of its management, little progress can be made in obtaining their cooperation.

3. Investors are entitled to, and only to, a fair return on their investment in the enterprise.

Dividends Must Be Attractive

This return must be large enough to attract, at current interest and dividend rates, all of the new capital needed to provide for efficient service and the growth of the enterprise. No utility which is unable to raise this necessary capital can be operated so as to produce the maximum benefits for distribution among the three groups nor can it meet effectively the increasing demands for service within its service area. Whenever the public obtains such unduly low rates or employees such unreasonably high wages as to impair the ability of the enterprise to pay to investors the return to which they are entitled, the efficiency of the enterprise will be undermined and the interests of all

three groups must ultimately be adversely affected.

Management, normally, is selected solely by the equity investors of the enterprise. For this reason, advocates of the socialization of utilities are prone to accuse management of trying to protect the interests of investors more aggressively than they protect the interests of the other groups. Our tentative philosophy, however, leads us to the belief that the management which is selected by these equity investors will ultimately fail in its efforts to protect them unless it is broad-gauged enough to realize that it can succeed only by distributing equitably among the three groups the benefits which accrue from the efficient operation of the enterprise. If this principle is sound, you can plainly see that another responsibility of management is to be alert always in securing the equitable distribution of the benefits derived from efficient operation.

Since all three groups will ultimately suffer whenever any one group gains and holds an undue advantage over the others, another prime responsibility of management is to convince all three groups that their respective interests, including the interests of the group entitled to select the management, can be best served only when all three groups are cooperating intelligently to make the enterprise efficient and successful.

Privately-owned and operated utilities are an important segment of the American private enterprise system, but unlike many other segments they are not subject to direct competition in the sense that one manufacturer of, let us say, automobiles competes with another manufacturer of automobiles. Operating utilities enjoy, as a rule, a quasi-monopoly in the furnishing of their particular services within the areas they are privileged to serve. They are subjected, of course, to a generalized competition. For instance, electric power competes with steam, diesel, gas or other sources of power within its service area. This kind of competition is fair and, if utilities hope to survive, they must meet it. Experience has demonstrated clearly, however, that the existence in the same service area of two competing electric systems, two gas distribution systems, two telephone systems, or two water systems results necessarily in higher rates or poorer service, or both, within the area affected. This lack of the discipline of direct competition, therefore, necessitates the establishment of governmental regulation. For this reason, utility management should encourage rather than discourage the establishment of fair and constructive regulation. It should, of course, resist the imposition of unfair and destructive regulation. For your guidance, a portion of this course will be devoted to a discussion of the principles involved in utility regulation.

The fact that utilities enjoy this quasi-monopoly carries with it another inescapable duty—that of participating actively in the development of the areas they serve. Unless they do participate actively and aggressively in their development, the areas they serve will be subjected unfairly to a severe handicap.

Nations which adopt socialism usually begin by socializing their utilities. Utility executives who believe sincerely that a properly operated private enterprise system is essential to the development of the kind of civilization which will be of the greatest benefit to mankind will find themselves in the front line trenches on the private versus public power battle front. It is one of their duties to learn how to defend private enterprise against its rival, socialism.

Adopt Equitable Practices

Let us advance for your consideration a theory of defense. The only way, in a free democracy, that private enterprise can successfully defend itself against the rivalry of socialism is to convince a majority of voters that private enterprise is the most desirable system. To do this, private enterprise must win the confidence and respect of the public. It seems axiomatic that, in order to win this confidence and respect, the principles and practices of private enterprise must be worthy. That is why we must adopt principles and practices which are sound and fair enough to arouse a determination on the part of the public to preserve this only system which will produce the greatest benefits for the greatest number. To win this battle, therefore, we must first set our house in order. Only executive management, the calling to which you aspire, can do this.

Now, management has the sole authority to set and, therefore, must accept the responsibility for the philosophy and policies of the utility. But, regardless of the virtue of its philosophy and policies, its operation cannot be efficient without the cooperation of its employees. It is hard to see how any company can ever hope to win the lasting confidence and respect of the public without first having obtained that of its own employees. That is why it seems somewhat wasteful for management to devote too much of its time and attention to securing the confidence and respect of the general public unless and until it has first been able to secure the confidence, respect, and cooperation of its employees. That is why so much time in this course has been allocated to the subject of industrial relations.

The attitude of the public toward utilities, commonly called public relations, exercises a most important influence in determining the success or failure of the utilities. The development of satisfactory public relations is, therefore, another important duty and responsibility of management. Our tentative philosophy suggests that efforts and expenditures designed to improve these relationships will be largely ineffectual unless and until management has first:

1. Developed a sound utility philosophy.
2. Won the confidence, respect, and cooperation of its organization through its adherence to this philosophy.
3. Produced a reasonably efficient operation.
4. Convinced its employees that they and their company must be good citizens of their communities and of their country. Top executives must set the example by an unselfish personal participation in non-partisan civic leadership.
5. Kept the public, its employees, and its investors well informed about the company's affairs, plans, and prospects.

Because of its own inescapable responsibility for accomplishing all of these things, it is plain that top management itself is really the public relations department, regardless of the fact that the company may have one particular officer who carries the title, Public Relations Director.

A company must learn how to effectively, pleasantly, and without braggadocio, keep the public informed about its affairs. Every company should learn how to "put its best foot forward." No company, particularly a good one, can afford to "hide its light under a bushel." Good publicity is essential. A part of your course has been allocated to this subject, as has the art of public speaking, because every executive should be able to express his views with clarity as and when the proper occasions arise.

Protection from Socialization

The inevitable ebb and flow of political tides are capable of affecting considerably the success or failure of utility operations. Our industry now seems thoroughly aware that the socialization of private utilities might well be accomplished through political action. It is, therefore, the duty of every utility executive to understand the cause and effect of these political tides. Such an understanding will assist us greatly to steer our ship safely through the hazardous reefs of practical politics.

Our tentative utility philosophy leads us to the conclusion that there are two separate and distinct defenses available to utilities which can and should be used to protect them against the political attacks of those who would treat them unfairly or even destroy them. The first defense is a direct and open counter-attack against unfair and destructive political proposals. The second defense is the utilization of the influence of our employees acting in their individual roles as citizens.

We must resist temptation to defend our cause by becoming enmeshed, either openly or clandestinely, in partisan politics. This course engenders public disrespect.

Let us analyze these two available defenses more closely. Management should state publicly its views concerning any political proposal, trend, or philosophy, which directly affects its business. We are obligated to utilize every proper means for protecting the inherent interests in our business of our customers, employees, and investors. These groups, after all, comprise a large segment of the general public. This will require our companies to present openly and logically to national, state, and local legislative bodies, regulatory commissions, to interested civic associations and to the public their views concerning any political proposal which improperly and adversely affects their business.

Such an open and direct defense against political threats should result in building for us public respect and good will, provided, of course, our case is based on solid facts and on a fair and sound utility philosophy. If, however, our philosophy is unsound or insincere and our facts are in any way slanted or distorted, our efforts are apt to be completely ineffectual. We should remember that there exists today among a certain segment of the public, whether justly or not, a fear that business in general and utilities in particular may endeavor to influence improperly the actions of political bodies or of individuals by so-called propaganda, lobbying, or deception. We must remove any justification for such a fear. That is why all political matters must be handled in a manner which is completely frank, honest, and aboveboard. In this way, and only in this way, can we convince the public that our political actions represent a sincere effort on our part to improve the common welfare rather than that of any company or individual.

While it is the plain duty of utility management to vigorously oppose any political proposal which threatens to affect adversely and improperly its business, we repeat that it is equally important for management to avoid national, state, or local political proposals of a partisan nature. Nothing is so destructive of public confidence and respect—the cornerstone of utility success—as for the public to discover that a utility is selfishly engrossed in purely partisan political activities.

Employees a Strong Defense

Our second means of defense against damaging political attack is through the utilization of the respect and good will of our employees. We should try to persuade every employee in our organizations that they should be good citizens of their communities and of their country. We must encourage them to interest themselves in all political matters affecting their nation, state, or community. Discussion of such matters with their fellow employees, friends, and neighbors will clarify their own views and tend to make them better citizens. With a clear understanding of political problems, our employees will surely contribute wisely to the common welfare through their personal influence and the exercise of their right of franchise. We have already learned that we must keep our organization frankly and fully informed concerning our beliefs, policies, affairs, problems, and prospects. We are strongly of the opinion that if our philosophy and policies are fair and sound, and if, because of this, we have won the respect and cooperation of our employees, then they in turn will exert a widespread and salutary influence among the public with respect, not only to political matters directly affecting their company, but also to all other political matters affecting our everyday lives. Such a political influence based on their respect and admiration for principles, in which they honestly believe, will meet with public approbation rather than with censure.

What an Executive Must Be

Your pursuit of this course, together with your discussion with your fellow students and instructors of the subjects covered, should increase your understanding of the objectives, duties, and responsibilities of utility executives and should, we think, convince you that a good executive must be a many-sided, broad-gauged, and generally capable person, rather than a specialist in some particular phase of the business. He must be capable of obtaining operating efficiency and at the same time be able to win the respect and confidence of people through his personality and character and his ability to develop fair and sound principles upon which to base the policies and practices of his company.

In other words, he must understand both the technical and the spiritual requirements of the business.

No top executive can escape his personal responsibility for:

- selecting and developing a competent staff;
- developing sound principles and good policies;
- obtaining a cooperative harmony throughout the entire organization;
- maintaining effective up, down, and lateral company communications;
- making good citizens of his company and its employees;

(*Continued on page* 344)

People Are Our Business

Allen King

Executive Vice President, Northern States Power Company

Extracts from an address before the EEI Industrial Relations Committee, Green Bay, Wis., July 17, 1953

IN greater measure perhaps than in any other industry, the electric industry is involved with people. In the daily operation of our business we are continuously dealing with people, and with all people in our service areas. We deal with people through people, and our whole intricate mechanical plant is only as good as the people who design, construct, and operate it.

There are many and varied ramifications to the electric industry. Many intricate processes are involved. The plants and equipment that have been developed reflect the latest in scientific and engineering advances, and there are many ingenious operating practices and techniques. But the success of an electric company in all phases of its operation rests upon a single common everyday component—people.

Therefore, it would be proper to say that, whether it be in our relations with our customers and the public or in the internal operation of our properties, *people are our business.*

Contrary to the opinion of many people who only see the mechanical phases of our operations, the electric power business is essentially a human business. We touch the lives of everyone in the community in very important ways—in homes, in offices or stores, and in factories and farms. The success of our development programs has made the use of electricity as common as water so that it has become, in effect, an actual necessity of modern living. When any service touches people so intimately and has become so important to them, it imposes upon the service organization great human responsibilities. If we lose our human approach to our customers and fail to deal with them as people, it will not be long before they will demand that someone else rather than ourselves undertake the supply of this vital service. It is important, therefore, that our customers and public relations be maintained in a human, friendly manner and that all customer or public contacts receive prime consideration if we are to maintain our standing in our communities.

It is upon our employees that we depend to maintain satisfactory public relations. There is no magic formula or special technique that will accomplish the task. Good public relations are achieved when every employee who contacts people in the course of his daily work does so in a friendly and courteous manner, as he himself would like to be treated. In other words, when each employee applies the golden rule in his human relations.

The president of a company is powerless to maintain good public relations unless his whole staff of contact employees is alert to its work and performs its human contacts in a proper manner. It is upon the actions of our employees that the success of our operations with our customers depends. A happy employee, interested in his job and conscious of his obligations to the public, is essential to success. It seems almost axiomatic that in his dealings with customers an employee will reflect his reaction to the manner in which the company management is in the habit of dealing with him. Hence the extreme importance of good employee relations and high morale.

Every business organization has a public reputation or character. Its standing in the eyes of the public is developed over the years by the actions of its employees and leadership. Most of the actions of the employees are a reflection of the attitudes of the leadership. No company can possibly build a sound reputation or character in the eyes of the public unless there exists within the organization a high state of employee morale—good employee relations. In other words, the internal relations between all groups of employees and management eventually develop the character of the organization and its reputation in its area.

If we will but think it through, it becomes apparent that an electric company is dependent almost entirely upon the actions of its employees to determine the nature of its customer relations. Only through a high employee morale derived from proper employee relations within the organization can we be assured that these human relations are being carried out in a favorable manner. Here the employee is the important element.

One of the characteristics of the electric industry is the enormous investment in plants and equipment required to render service to the public. Modern power plants and transmission lines are marvels of engineering achievement, and they intrigue public fancy. They represent a big part of the asset side of our financial balance sheets, and some may feel that they represent our greatest asset. Employees, however, are our greatest asset.

All of the millions that we have invested in plants and equipment are worthless without the human side. It takes people to give life to material things. It takes people to design, construct, and operate the physical elements of our business; and our operations can be no better than the people who have had a part in them. Without the cunning touch of a human hand and the ingenuity of a human brain, what good are millions of dollars worth of copper, steel, rubber, and concrete? Again, we are dependent upon people, upon the employee, and it becomes extremely important to build high morale, and maintain satisfactory employee relations.

Good employee morale does not just happen, and it cannot be "bought" by company parties and picnics and such techniques. Good employee morale must be earned by management, by its daily actions and policies. Employees should like their jobs, feel the importance of what

they are doing to over-all problems, and should respect their leaders and like to work for them.

Therefore, every act or policy of management should not only be measured for its effect on public relations but also for its effect upon employee morale. Every promotion, change of work, change of desk or office, or recognition of merit has its effect upon morale. It is not enough that management may decide to do something. The correctness of its decision must be readily recognized by a majority of workers or loss of morale will result. Management must recognize that every public action that it makes is watched carefully by the employees, and these actions strongly influence the general morale. Management must be continually aware of this constant critical interest of employees.

Only by management's conscious care in everyday actions can high employee morale be encouraged, and only through high employee morale can good public relations be maintained and operations be carried on efficiently.

In all of our actions we must continually remember that an employee is a human being and must be dealt with as such. Employees must not be handled as we would handle fuel, poles, wire, and other such materials that go into our business. It is difficult at times to maintain a human approach, and particularly when large portions of our employees are dealt with through collective bargaining and under formal contractual agreements.

In spite of certain reservations that many people may have on the subject, collective bargaining is essentially sound for large groups of our operating employees, and, furthermore, it is a reality which we must face regardless of opinion. In engaging in our collective bargaining negotiations, great care must be exercised lest we forget that the employees in question are people and not commodities. Most of our failures in maintaining good employee relations while engaging in formal dealings with a union are the result of the tendency to deal with labor as a commodity. Many times employee representatives themselves succumb to this temptation.

I well remember an incident that occurred in Grand Forks, N. Dak., some ten years ago. The YMCA was conducting a forum on various current topics. I was asked to participate in a panel on labor relations. On the panel were a housewife, superintendent of schools, retail merchant, secretary of the Trades and Labor Assembly, and myself representing the employers' point of view. At that time there was a labor dispute involving bakery employees and most of the issues had been settled, but the employers were refusing to sign a formal contract. They were willing to agree to wages and working conditions but did not want to formalize their agreement by signing a contract. That issue came up for discussion before the panel.

The labor representative on the panel was taking issue with the point of view of the employers in the case, and, in the course of his discussion, he turned directly to me and said, "I cannot understand why it is that you businessmen refuse to sign a formal contract for your labor. You sign contracts for your coal and other commodities that go into your business, and why are you not willing to contract for labor in the same way?" I asked him directly if he considered labor a commodity in the same sense as our generating fuel for which we engage in contracts. His answer was, "Yes."

That gave me the opportunity to say at that point that we, the employers, had not yet reached the position where we considered our employees commodities to be bargained for in the same sense as fuel and that we still considered them human beings.

I did not for a minute think that the labor representative on the panel honestly meant what he had been perhaps tricked into saying publicly, but I use the illustration only to point out how easy it can be to permit ourselves to deal with union contracts on a very technical basis and in a manner that would place labor in the commodity status. It is a danger to be avoided if we are to maintain proper employee morale.

Dealing with people is not like dealing with machinery or materials. We must always recognize that each individual has his own personality and character. We must recognize that, even though we are bargaining collectively for many of our employees, they are still human beings with human aspirations and human reactions.

At the bargaining table, of course, we often are up against tough negotiations. A great deal of resourcefulness is required to keep the negotiations on an amicable basis. In a business that is so dependent upon its human side, a fight to the finish between management and employees is something that should be avoided.

There is no set pattern that anybody can develop as a guide in union negotiations or other phases of labor relations. To attempt to set a pattern and adhere to it is something like attempting to bring up a child according to a book on child psychology that was probably written by a spinster in the first place.

I recently saw the results of a survey that was made among certain employee groups, which listed in order of importance to the employee certain things that he wanted most in connection with his work. I did not expect salaries and working hours to be first, but I was amazed to find them quite a way down the list of employee desires. High on the list were the simple little matters of recognition for work done and the opportunity for advancement to a more important job. Also on the list was the desire to have a good boss, one that the employee respected and enjoyed working for. As a matter of fact, the points that appeared highest on the list were all those things that are involved with employees as people.

It would seem that no employee relations program can be successful unless it is keyed to the idea that employees are people. Even in negotiations for a union contract it is well to keep this in mind, for anytime a company achieves a "sharp" settlement of a union contract, it is breeding trouble for itself. There are future contracts to come up, and the human reaction to being beaten in a deal will develop an atmosphere that will make future negotiations difficult and contribute to deterioration of employee morale.

Throughout contract negotiations it is entirely possible to maintain an atmosphere of reasonableness that becomes contagious and, if the rep-

(Continued on page **344***)*

The Importance of Good Employee Relations

H. P. Taylor

Vice President and Treasurer, Wisconsin Public Service Corporation

Extracts from an address before the EEI Industrial Relations Committee, Green Bay, Wis., July 17, 1953

IN my mind the success or failure of an electric company and the preservation of the private enterprise system are principally the result of a chain reaction which starts with the calibre of employees (from the top of a company to the bottom), their education and training, their attitude and morale. Of course, we must have good company goals and objectives. But if we do not have good employee relations, I don't see how we can have good customer, public, and stockholder relations and, in turn, good government.

Helping each employee to realize his worthwhile ambitions is the primary concern and responsibility of industrial relations executives. Most everyone, whether he has $1 or $1,000,000, wants largely the same thing—a better life for himself, his wife, and his children. In the process he would like a harmonious and useful life. In order to attain these objectives, he must be associated with a profitable business.

It is saying the obvious to point out the need for intelligently planned, long-range industrial relations programs utilizing the best tools and techniques developed to date in the industrial relations field. Continuous study and research must be carried on because of the importance of human relations. Undoubtedly many mistakes will be made, but it is important that our sights be raised as to areas in which industrial relations work should be carried on because of the significance of end results.

Having spent most of my business life in the accounting and financial ends of the electric business, I am probably more sensitive to the importance and effect of employee attitudes and morale in this area. In this connection, a recent experience brought home to me that a company is known by the "employees it keeps."

Wisconsin Public Service Corp. had been owned by a single stockholder through its whole history up to December 1, 1952. At that time the holding company distributed our common stock to its stockholders, and we became an independent operating company with several thousand stockholders. Our common stock then was bought and sold in the security markets and, consequently, several security houses, security analysts, and investment advisers wanted to know more about the company. Several individuals and groups made appointments with us to look us over so they could appraise us and our securities.

We went to some length in planning trips over the property so that each group could see our steam and hydro plants, lines, office buildings, etc. When the first of these groups arrived, we discussed the program we had planned. These people said they were not interested in our physical plant—they knew that we had modern, well maintained plants and other facilities. They wanted to know more about our people, who they were, their attitudes, what the people in the communities served thought about them, etc. They were interested in people—not brick, steel, and mortar.

Needless to say, we quickly changed our schedules and planned the trips to let the groups see and visit people in our company and in our territory. This is the area in which a company cannot be appraised by sitting in far-away places and studying statistics. What people find out about a company's employee attitudes, employee relations, and community relations has a very important effect on the price at which the company finances its expansion programs, the quality and desirability of its securities in the public markets, and its stockholder relations.

Another area in which employee education and training is very important is that of preserving the free enterprise system and our American way of life.

We in the electric industry are free enterprisers, and much has been done to alert employees to the dangers of socialism to our economy and political life and, particularly, to the industry. Several positive programs are presently being carried on by industry leaders to further the free enterprise system and to get and keep government out of business. I believe that these militant, positive programs provide rallying points for employees, stimulate pride in a company, and improve employee attitudes and morale.

Is the electric industry making the most of its assets in developing these rallying points? In this regard, we had an interesting experience in Wisconsin. During the past 35 or 40 years, the Wisconsin River has been developed as a power source for electric and paper companies. A tax-paying reservoir company was also formed, with all capital provided by investors.

For years, however, during the Roosevelt and Truman Administrations, electric companies throughout the nation were on the defensive and their employees propagandized on public power and the "sins" of the utility industry. In Wisconsin, few electric company employees knew what was going on in a constructive manner right in their back yard on the Wisconsin River. We were so busy being on the defensive that we didn't realize what effect the propaganda machine of the government was having on employee morale and attitudes, which, in turn, affected public and stockholder relations and the personnel of government.

Then a positive program was developed a few years ago. The Wisconsin River was publicized as "The Hardest Working River in the Country." It was pointed out that it did everything that the government was trying to do in developing flood control, conservation, and power sites and that its improvements were privately financed and paid taxes. This

program gave employees a rallying point, gave them pride in their companies and improved their morale.

The program included a model of the river which was displayed throughout the state. Booklets detailing this free enterprise development were distributed, and the story was also carried in national magazines and the Congressional Record. Recently Wisconsin Power and Light Co. produced an excellent movie of the river, and this is available for showings. A short time ago it was featured on a television program when the *Milwaukee Journal* station changed channels.

It took years for Wisconsin utilities to realize the effect on employee and public relations that publicizing this asset would have. There are undoubtedly many other assets which are not being publicized in a positive, militant fashion so that the facts will be made available to employees and the public. We ought to seek the facts out and spread them far and wide.

We had another recent experience which impressed me with employee reaction to the attempt, on the part of top management, to be fair. We all like this quality and we can overlook a lot of things if we know the desire to be fair is there. The tools used to demonstrate this fairness are sometimes difficult to develop.

Within the last few years our personnel department, with the assistance of others, has ranked all of our supervisory jobs (except a few at the top), irrespective of departments. Many people had thought this task impossible. Apparently Wisconsin Public Service's personnel department didn't know it couldn't be done, because it went ahead to do it. An initial ranking was completed a few years ago, and since then it has been refined. Recently our supervisory group was told in some detail that the job had been done and how it was done.

The reaction of the supervisory groups, in my opinion, has been good. The ranking has proven to be a very constructive move in improving employee attitudes at the supervisory level. This group, of course, is vital to the success of employee relation programs and to the success of business. This program proved to me that the hard jobs can be done and that the benefits justify the effort.

I have just mentioned a few of the areas in which industrial relations work in human relations is vital to the success of our business. These could be multiplied many times. The important thing is that an industrial relations man's vision be broad as to the responsibilities and opportunities he has to contribute to the long-term growth, security, and profitability of his company. Based on past records, I'm sure industrial relations people will meet the challenge of the future.

People Are Our Business

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resentatives of labor by experience have found company representatives to be honest and fair with them, negotiations can be maintained in such an atmosphere of reasonableness. It is also possible, if attitudes are right, for company personnel representatives to exercise some leadership in the development of the proper union contract.

We cannot get everything we think we want at all times. In matters of labor negotiations we perhaps make progress slowly and, as a result, barter and compromise. As was stated in the famous passage from the Speech on Conciliation with America that Edmund Burke delivered on March 27, 1775: "every human benefit and enjoyment, every virtue and every prudent act, is founded on compromise and barter." That is a basic principle whenever we are dealing with people.

The whole pattern of business life has changed in recent years. The old relation of proprietor to worker has disappeared, at any rate, with respect to our large business organizations. The old concept of capital versus labor has become outmoded; the capitalist or owner is no longer the manager of large businesses. Even the workers themselves are shareholders, and the management of our large businesses is vested in a management group of employees who have a threefold obligation to discharge. They have an obligation to the public, to employees, and to shareholders, and one obligation must not outweigh the other. It is even difficult to draw a line indicating where the management group begins and where the strictly employee group ends. Phases of management are evident in all levels of modern utility management. The old "boss" as we knew him has disappeared. Even bosses are now people. The successful "boss" today is no longer the master; he must be the leader. The whole process of humanizing our business organizations has proceeded a long way. This is particularly apparent in the utility business.

People *are* our business; and our success is dependent upon the maintenance of a sound human approach to all of our problems.

Executive Course

(*Continued from page* 340)

maintaining effective communications between the company, its investors, and the public;

understanding the principles and whims of politics;

securing a reasonable cooperation among the public, employees, and investors; and

securing the equitable distribution among the three interested groups of the benefits derived from good policies and efficient operation.

The objectives to be sought by utility executives are simple:

to operate the enterprise so efficiently that it will produce the maximum benefits for distribution equitably among the three groups;

to establish policies worthy of the confidence and respect of employees and the public;

to make of the enterprise and its employees good citizens of the area it serves and of the country.

If we can accomplish these objectives, we should experience little difficulty in convincing the public that the private enterprise system is superior to socialism.

The Engineer and Accountant Work Together on Solving a Technical Problem

E. Devere Cowles
Machine Methods Technician, Customers Billing Department,
The Detroit Edison Company

Sponsored by the Electronic Accounting Machine Developments Subcommittee of the EEI Accounting Division Executive Committee

Comment on this article made by the Electronic Accounting Machine Developments Subcommittee:

While the fields of the accountant and the engineer in public utility operation have overlapped to a considerable degree, the tools used by each have been quite generally separate. The development of Electronic Accounting Machines may well bring about a closer integration of these tools. A step in this direction is the use of Type 604 Electronic Calculating Punch, used by many companies for accounting purposes, to solve an engineering problem. The Subcommittee on Electronic Accounting Machine Developments is happy to suggest that accountants and engineers consider together the possibilities of greater use of the tools of the accountant to assist the engineer in the solution of some of his technical problems.

ENGINEERING and research departments of all companies become involved in voluminous and complicated mathematical operations. Some of these problems are so large that it is impractical to attempt a solution unless a means is found that is fast and efficient as well as highly accurate. Many such problems exist in The Detroit Edison Co. today, one of which has become quite significant in our Engineering Department. It is a problem dealing with high-voltage transmission line losses between our power plants and points of interconnection with other companies.

Today, with our present four power plants, three interconnections with a neighboring electric company, and the future increase of two power plants and other interconnections, both complexity and volume of calculation prohibit manual methods of determining transmission line losses. It was found during the investigation period that for a given net power transfer the individual "tie-line flows" could vary in a wide range and affect Detroit Edison's system losses considerably, representing many thousands of dollars annually. The information derived from these calculations would be used for billing the interconnection companies for any sale of power and also for setting up generation and interchange schedules for our own system operation.

The time required to make the calculations manually on a desk calculator was estimated to be over 1,700 hours. To cover the wide range of plant output and interconnection demands, these calculations would consist of 500 case studies. In a search for a better method, the Engineering Department contacted the Customers Billing Department where IBM Type 604 electronic computers are in use for accounting purposes, primarily billing. By joint study it was determined that the problem could be performed on the Type 604 and associated equipment in about 50 manhours.

Mathematical Background Needed

In order to understand the problem, some mathematical background is necessary, which should include knowledge of matrix solutions. The formula necessary for this calculation consisted of a *vector* x *matrix* x *vector* multiplication with an 8 x 8 matrix. This problem can be broken down to a simple step-by-step calculation with progressive storage and addition which can be handled by the 604 calculator. (A matrix is a very simple and concise method of writing out a very complicated mathematical operation.)

While these highly technical mathematical engineering terms seem foreign to those of us dealing primarily with accounting problems, they are really commonplace to the average engineer or mathematician who, on the other hand, is not familiar with the average accounting machine. This presented a challenge to the accounting and engineering groups of our company. However, the people in the two groups with their respective "know-how," by actively working together as a team to solve the problem at hand, had no difficulty whatsoever in working out the details and arriving at a satisfactory conclusion.

A more complete explanation of the solution of the problem and the method used is given for those with engineering or mathematical background desiring to follow through the operations we performed.

This particular matrix involved a set of coefficients, previously derived with the aid of the Detroit Edison A-C Network Analyzer, that do not change unless there is a major alteration in the bulk power system of the company. The vector consisted of variable factors representing the outputs of each plant and interconnection exchange in megawatts. In the following example, the letters a through i represent the factors of the constant matrix and the letters x, y, and z, the plant outputs in megawatts for the vector.

In this example, a 3 x 3 matrix was used for simplicity which can be enlarged upon to suit the needs of any company.

For the purposes of control in the 604 to execute properly the calculations, assignments were given to rows and columns of the matrix (Fig. 1). The rows are the horizontal set of values and the columns are the vertical. For example, in the above 3 x 3 matrix, the upper left corner value a would be located as row 1, column 1 or location 11 (as indicated in the lower right corner of the value square). The next value to the right would be row 1, column 2 or 12, etc.

These codes were punched in a deck of master factor "C" cards, "C" representing the constant matrix. The corresponding value for each row and column was also punched in an assigned field of these cards. In addition two other codes were assigned—

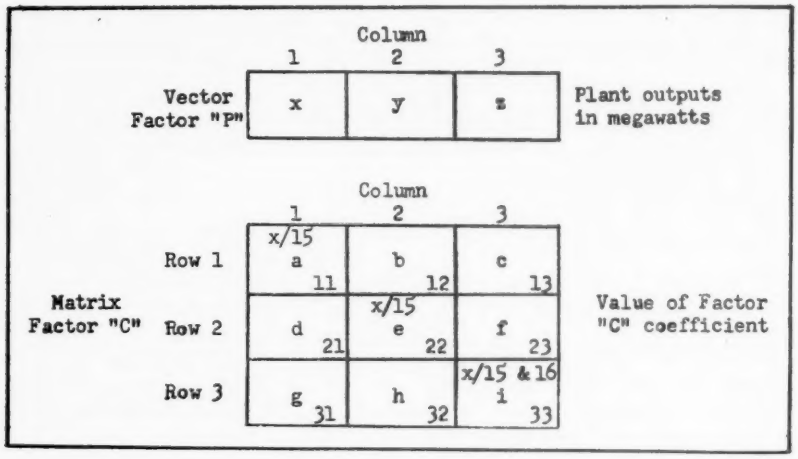


Figure 1

one to identify the diagonal values (a_{11}, e_{22}, etc.) and one to indicate the end of the problem. These were x code punches in columns 15 and 16, respectively. Negative values were always punched with an x over the least significant digits of the value. From this master deck of 64 cards, in the case of an 8 x 8 matrix, multiple decks were reproduced to correspond to the number of sets of calculations to be performed (500 in our case).

One Set Needed for Each Study

It was next necessary to manually punch the vector (factor "P") cards with identifying column number and the corresponding plant output in megawatts. One of these sets was necessary for each case study to be calculated.

The describe briefly the operation about to be performed, we can again refer to the 3 x 3 matrix described previously and list the calculations to be performed in this manner:

a_{11} times x = product (punch) and store. (Store a_{11} because of x col. 15).

b_{12} times y plus previous product = progressive product-sum (punch and store).

c_{13} times z plus progressive product-sum = total product-sum and a_{11} (stored because of x column 15) times total product-sum = row total (punch) and store for accumulation of row totals.

d_{21} times x = product (punch) and store.

e_{22} times y plus previous product = progressive product-sum (store e_{22} because of $x/15$) punch and store.

f_{23} times z plus progressive product-sum = total product-sum times e_{22} = row total plus previous row total = progressive row total (punch and store).

g_{31}, h_{32}, and i_{33} are treated in a similar manner. Upon completion of above calculations the $x/16$ (last card of matrix) permitted a further multiplication of a constant by the final product-sum for the final solution.

In order to prepare the cards for the above operations it was necessary to apply one deck of the master variable factor "P" cards to one deck of the master "C" factor cards and sort on the column number. A gang punch operation was then performed to punch the variable factor "P" into each card of each column grouping of the constant "C" factor cards (Fig. 2).

The cards were next sorted to the row code which automatically removed the master variable factor "P" cards, because of no punching in column 1-3, and placed the completed matrix cards in the proper sequence for calculation.

First card location No. 11 with values a and x

Second card location No. 12 with values b and y

Third card location No. 13 with values c and z

Fourth card location No. 21 with values d and x

Fifth card location No. 22 with values e and y

Sixth card location No. 23 with values f and z

Seventh card location, etc. with values g and x

The Type 604 electronic calculator was then used to calculate and punch the partial product-sum in each card and a final total in a separate field of the last card of each matrix. A verification operation was also performed to detect any possible calculation errors prior to listing of the cards on a tape prepartory to a graphic chart construction. These charts are very valuable in determining generating costs for power transfer between ours and a neighboring company. They are also useful in determining the conditions at which it is more economical to purchase power at favorable rates after considering incremental transmission losses in the Detroit Edison system.

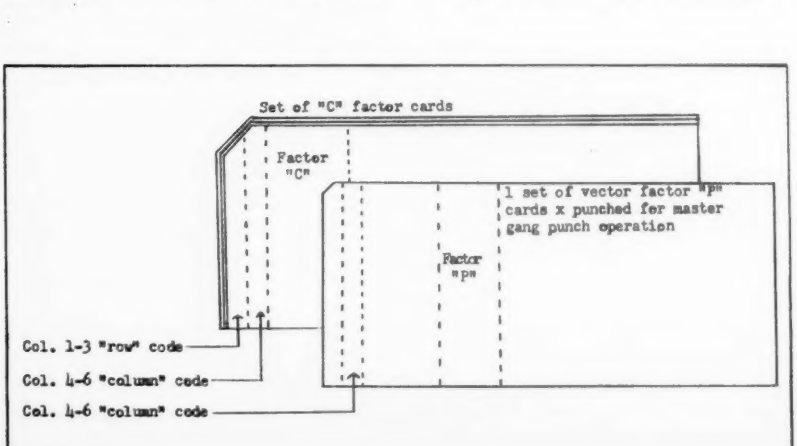

Set of "C" factor cards
Factor "C"
1 set of vector factor "P" cards x punched for master gang punch operation
Factor "P"
Col. 1-3 "row" code
Col. 4-6 "column" code
Col. 4-6 "column" code

Figure 2

Industrial Relations Conference Program

Fred R. Rauch

Vice President, The Cincinnati Gas & Electric Company

Chairman, EEI Industrial Relations Committee

THE Seventh Annual Round-Table Conference of the EEI Industrial Relations Committee, to be held this year at the Sheraton Hotel, Chicago, Ill., on October 12-14, inclusive, will offer a type of program unavailable anywhere else in the electric light and power industry. The steady growth of industry, contributing to a higher degree of complexity in employee-management relations problems, makes it extremely important that industrial relations people, especially the newer ones, develop a greater capacity for coping with and solving these recognized problems. Attendance at this forthcoming conference will be of inestimable value to present and future leaders in the electric industry.

The committee in planning the program has brought together the theoretical and practical phases of some of the more pressing and larger problems in the industrial relations field. The technique to be used in conducting the conference combines short presentations of the theory and philosophy of four topics, with a discussion period in which each participant will have ample opportunity as a member of a small group to discuss each topic under the guidance of recognized industry leaders. The luncheon speakers, general session speakers, and conference leaders are listed with their topics in the adjoining box.

A company's industrial relations department, more than any other, must be aware of and highly sensitive to the thinking of top management. Realizing this, the committee has invited Walter H. Sammis, President of the Institute and of Ohio Edison Co., George M. Gadsby, President, Utah Power & Light Co., and Ernest R. Acker, President, Central Hudson Gas & Electric Corp., to speak on management problems and help industrial relations men develop a greater familiarity with top management thinking. Messrs. Gadsby and Acker are past presidents of EEI. These men will express their views at luncheon meetings on each of the three conference days. The presentations will run the gamut from definitions of some of the problems to the actual techniques used in solving them. Here will be an excellent and unusual opportunity for all of those working in the industrial relations field to become familiar with areas in which they must develop themselves to take their proper place in management.

The backgrounds and philosophies of the four conference subjects—"Selection of Employees," "Selling Fringe Benefits to Rank and File Employees," "Control of Benefit Costs," and "Preparation for Negotiations"—will be presented by four outstandingly successful electric company industrial relations men in a general meeting of all participants at 10:00 a.m., Monday morning. Then, as in previous conferences, those present will be divided into small groups of 20 to 25 with an experienced conference leader to facilitate discussion by each group of the down-to-earth, how-to-do-it phases of each of the topics. With an anticipated attendance of about 200, these groups will be small enough to enable thorough individual participation and exchange of ideas. The group conferences will take place on Monday afternoon, all day Tuesday, and Wednesday morning.

The representatives in each group will be from companies varying in

Speakers and Conference Leaders

Luncheons

WALTER H. SAMMIS, President,
Edison Electric Institute, Ohio Edison Co.
GEORGE M. GADSBY, President,
Utah Power & Light Co.
ERNEST R. ACKER, President,
Central Hudson Gas & Electric Corp.

General Meeting

J. C. ARNELL, Senior Assistant Personnel Director,
Consolidated Edison Co. of New York, Inc.
C. B. BOULET, Director of Personnel,
Wisconsin Public Service Corp.
H. K. BRECKENRIDGE, Vice President,
West Penn Power Co.
R. G. KENYON, Vice President,
Southern California Edison Co.

Ask the Veeps

V. C. BRENNAN, Vice President,
Union Electric Co. of Missouri.
J. S. GRACY, Vice President,
Florida Power Corp.
W. L. JONES, Vice President,
Potomac Electric Power Co.
F. L. LARKIN, Vice President,
Wisconsin Electric Power Co.
W. F. MOSES, Vice President,
New Jersey Power & Light Co.
C. Y. OSBORN, Assistant Vice President,
Long Island Lighting Co.
F. R. RAUCH, Vice President,
The Cincinnati Gas & Electric Co.

Collective Bargaining Settlements

H. A. PETERSON, Assistant Vice President,
American Gas and Electric Service Corp.

Control Of Benefit Costs

E. J. BRILL, Director of Employee Relations,
Pennsylvania Power & Light Co.
E. G. HUCK, Director of Research and Training,
The Cincinnati Gas & Electric Co.
M. F. OSTERLING, Director of Personnel,
Hartford Electric Light Co.
E. A. WERNER, Personnel Manager,
Gulf States Utilities Co.

Preparation for Negotiations

H. F. FOSTER, Assistant Director of Employee Relations,
Consumers Power Co.
S. J. MCKELVEY, Managerial Assistant,
Public Service Electric & Gas Co.
H. R. PEARSON, Manager,
Personnel Services Department, Iowa Power & Light Co.
H. B. TYREE, Assistant to President,
The Detroit Edison Co.

Selection of Employees

J. W. CAROTHERS, Manager,
Personnel Department, Consolidated Gas Electric Light & Power Co. of Baltimore.
J. P. FLEMMING, Coordinator of Training, Safety, and Employment,
The Cleveland Electric Illuminating Co.
J. T. HUGHES, Personnel Director,
Arkansas-Missouri Power Co.
J. M. MCCONNELL, Employment Manager,
Rochester Gas and Electric Co.

Selling Fringe Benefits To Employees

H. F. CARR, Manager, Personnel Department,
Pacific Gas and Electric Co.
G. W. FEWKES, Manager, Personnel Department,
Philadelphia Electric Co.
K. I. JACK, Advertising and Publicity Manager,
The Washington Water Power Co.
W. H. SENYARD, Director of Personnel,
Louisiana Power & Light Co.

size and geographic location. Some will be experienced men; some, young with less experience. In this way a wide variety of methods of handling the problems discussed will be developed. Ideas prevalent in one region of the country will be made available to all. Experienced men will obtain a yardstick with which to measure their own performances. Younger men will have the chance to learn the intimate details of how these problems are tackled and solved. To aid expression and discussion of a wider assortment of ideas, no group will have as a member more than one man from a company.

Operating Executives to Attend

While in the vein of multiple representation, it might be pointed out that some smaller companies may find it advantageous to have operating men in attendance as well as industrial relations men. Although the discussions will be of particular interest to industrial relations people, operating men with more than average responsibilities in this area will find the papers and conferences to be of real value to them. Some companies have already sent in six reservations including both industrial relations and operating executives.

On Tuesday, an evening get-together will be held for those interested in exchanging information about current collective bargaining negotiations and recent settlements. This strictly informal session will be very timely since the advent of October usually is a harbinger of the winter negotiating season. Here will be an opportunity for all participants to be up-to-the-minute on what is happening throughout the industry.

A new and possibly original session —Ask the Veeps—will be held Wednesday afternoon at which no holds will be barred and no topics tabooed. There will be a panel of experienced management men ready to answer questions on conference subjects and matters not on the agenda as well. Questions may be submitted in advance of the session.

One of the greatest benefits and by-products of a conference of this sort is the chance to get to know personally men of many different companies. A first-name acquaintanceship with other industrial relations men in the industry means a freer, fuller flow of information and exchange of ideas the whole year round. All will have an opportunity to meet informally and get to know one another during the Hospitality Hour on Monday evening.

In conclusion, a word of commendation is in order for the fine hard work of this year's subcommittee of the Industrial Relations Committee which planned the conference. Jay Alan Reid is chairman and together with John C. Arnell, Donald Bartlett, R. G. Kenyon, Frank G. Gleeson, and E. J. Brill has set the stage for a real opportunity in training for industrial relations leadership in the electric light and power industry.

Reservations should be sent to E. S. Evans, Secretary, Industrial Relations Committee, Edison Electric Institute, 420 Lexington Ave., New York 17, N. Y. The conference fee, including three luncheons and the Hospitality Hour, is $35. Checks should be made payable to Edison Electric Institute.

Attendance at this conference is limited to industrial relations men and operating executives of privately-owned, business-managed electric light and power companies.

Philip Torchio, Jr.

PHILIP TORCHIO, JR., Commercial Vice President, American Gas and Electric Service Corp., died recently of a heart attack while water-skiing at his summer home at Big Wolf Lake, N. Y. He was 45 years old.

Born in Bronxville, N. Y., where he still resided, Mr. Torchio was graduated from the Massachusetts Institute of Technology with an electrical engineering degree in 1930. Following 15 years with Consolidated Edison Co. of New York, Inc., he joined American Gas and Electric as assistant to the operating vice president in 1948. He was named commercial vice president last October.

During World War II Mr. Torchio served for three years in the Navy as a lieutenant. He was a member of the EEI Commercial Division General Committee and a member of the American Society of Mechanical Engineers.

Surviving are his widow, son, and daughter. Services were held in the Holy Name Roman Catholic Church in Faust, N. Y., and burial was in the Faust Cemetery.

E. Parish Lovejoy

E. PARISH "PAT" LOVEJOY, former executive of The Detroit Edison Co., died of a heart ailment last month in a Beaufort, S. C., hospital.

Well-known throughout the electric industry, he had been with Detroit Edison since 1929, starting as a staff engineer for the late Alex Dow. During the 1930's he held key positions with two manufacturing concerns in which Detroit Edison was interested, first as sales manager of Electromaster, Inc., and later as president of the Detroit Electric Furnace Co. He was director of Detroit Edison's Public Information Department when he relinquished his duties more than a year ago because of illness.

Born March 17, 1900, in Princeton, Ill., Mr. Lovejoy was the descendant and namesake of Abolitionist newspaper editor Elijah Parish Lovejoy, killed by a mob in Alton, Ill., in pre-Civil War days. As a University of Michigan undergraduate, Mr. Lovejoy edited the *The Michigan Daily* in the early 1920's. He joined the General Electric Co. as a cadet engineer in 1923 and served that company for six years before coming to Detroit Edison.

Active in Detroit civic organizations, including the Council of Social Agencies, he was president of the Boys' Republic and was also a member of the Engineering Society of Detroit, University Club, and Public Relations Society of America.

Mr. Lovejoy is survived by his widow, three daughters, and a son. Family services were held at Beaufort, a memorial service to be held late in September at Christ Church, Grosse Pointe, Mich.

Successful Applications of Resuscitation Recognized by EEI Awards

PROBABLY no literature in the electric industry illustrates the significance of company safety training programs with greater force than that formed by applications for the EEI Medal.

These EEI Medal case histories bear witness to the prime importance of safety consciousness at all times. They show with dramatic impact how carelessness, a hastily planned job, a momentary disregard for company safety rules, can result in tragedy. They demonstrate the importance of dynamic safety programs to help counteract the human error which accounts for the bulk of the accidents within the industry.

Safety training is never so appreciated as in times of emergency. For this reason, it is often difficult to instill safety consciousness in employees who have never witnessed or experienced the results of carelessness on the job. The time spent in becoming familiar with company safe work procedures and in learning resuscitation techniques may seem wasted until an accident emphasizes their vital importance.

To employees who have been involved in a near fatality, however, there is no doubt about the need for constant safety training. The expressions of gratitude of those rescued from death to those called upon to effect the rescues described in the files of the EEI Medal cases eloquently prove this.

As Switchboard Wireman Albin E. Carlson, Northern States Power Co. (Minn.), said recently upon receiving an EEI Medal for resuscitating Electrical Foreman Nat Hanson:

"I appreciate the honor very much, but I am even more grateful that Nat Hanson is all right. I realize that any quick action I took at the time of the accident I owe to the company's program of safety training."

The EEI Medal was established 20 years ago to honor electric company employees who, often at great personal risk, successfully apply resuscitation techniques to revive victims of electric shock. Since the medal's inception, over 350 have been authorized for presentation.

Contained in the following article are summaries of eight resuscitation cases for which EEI Medals were awarded in 1952. Each case is a testament to the valor and resourcefulness of the men involved. Each is also a dramatic reminder of the constant vigilance required to prevent tragic accidents.

ALBIN E. CARLSON
Northern States Power Company

At the Riverside Generating Plant of Northern States Power Co. (Minn.), on the morning of October 15, 1952, Electrical Foreman Nat Hanson and Switchboard Wireman Albin E. Carlson were installing new control wiring on a set of 13.8-kv oil circuit breakers. Similar work had been completed on five other sets of breakers, each of which had been deenergized and isolated during the installation. However, as the work to be done on the sixth set was minor, only the disconnects on the bus side were opened.

The operating mechanisms were located on the floor directly over the breaker cells, and as Hanson proceeded to make control changes, he dropped a small screw. Thinking that it had fallen into a breaker housing, he went downstairs, forgetting that the breakers had not been completely killed. He removed the protective door on the center phase of a breaker, exposing the live tank, and in looking for the screw contacted the tank. He was immediately rendered unconscious and fell to the floor.

Carlson ran to his co-worker, whose breathing had stopped, and within a matter of seconds had begun to administer prone-pressure artificial respiration. Hanson showed signs of life in about four minutes, and following four more minutes of resuscitation, he sat up and asked, "What happened?" He was then taken in an ambulance to a hospital, where he was treated for severe burns.

Albin E. Carlson was presented an EEI Medal by B. F. Braheney, President of Northern States Power, at a recognition dinner held in the Radisson Hotel, Minneapolis, on January 13, 1953. Also on hand to participate in the ceremony was Nat Hanson, whose life had been saved. A feature story on the presentation and rescue appeared in the February, 1953, issue of *Our Shield*, company employee publication.

EMORY W. ANDERSON
New Jersey Power & Light Company

On September 26, 1952, a crew of the New Jersey Power & Light Co. was running in several sections of

ALBIN E. CARLSON (center), Northern States Power Co. (Minn.), receives EEI Medal and Certificate from B. F. BRAHENEY, President of the company, for his life-saving resuscitation of NAT HANSON (right), on hand at the presentation.

EMORY W. ANDERSON (center), New Jersey Power & Light Co. Lineman, accepts EEI Medal from H. C. THUERK (left), company President, for successfully resuscitating KENNETH M. STINSON (right).

FRANK B. GRABACK (right), New Jersey Power & Light Co., is presented with an EEI Certificate of Assistance by President THUERK.

street-lighting wire in Basking Ridge, N. J. Lineman Kenneth M. Stinson had placed rubber hose on the lines of a 35-foot cedar pole and proceeded to reach over a 4.6-kv conductor to tie another conductor to an insulator. In so doing, he accidentally moved a section of hose from under an insulator hood, exposing the 4.6-kv line, which he contacted with his chest.

The flash of an arc alerted crew members to the accident. Lineman Emory W. Anderson was standing on the ground, and he immediately put on his tools and climbed the pole to a point under his co-worker. Stinson had collapsed in his safety belt, free of electrical contact, and was unconscious and not breathing.

Positioning the injured man for application of the Oesterreich Pole Top Method of Resuscitation, Anderson began treatment, which was continued for three or four minutes before Stinson regained consciousness and was able to breathe normally. In the meantime, Lineman Frank B. Graback had climbed the pole, and he helped Anderson quiet Stinson, who insisted he could descend alone. Graback cut Stinson away from the pole and then helped lower him on Anderson's safety belt.

Other members of the crew had summoned the Basking Ridge emergency squad, which transported Stinson to the hospital for treatment of severe burns. He was away from work for about six weeks.

Emory W. Anderson was presented an EEI Medal and Frank B. Graback a Certificate of Assistance last February at a special ceremony attended by company officials and employees of the Bernardsville Line Department. H. C. Thuerk, President of New Jersey Power & Light Co., made the awards, with Kenneth M. Stinson as a happy spectator. A story on the ceremony and rescue appeared in the February 19, 1953, issue of the *Bernardsville News*.

VIRGIL W. THOMPSON
Pacific Gas and Electric Company

On the morning of February 29, 1952, a Pacific Gas and Electric Co. crew was framing poles at Kifer Sub-

Four Pacific Gas and Electric Co. employees receive EEI Resuscitation Awards from RAYMOND W. WHITE, Manager, Department of Claims and Safety. Shown left to right are: WHITE, VIRGIL W. THOMPSON, EEI Medal recipient, DEWEY TRAYLOR, PETER P. WOJCIK, and JACK H. TODD. The four also received P. G. and E. Awards.

The Gulf States Utilities Co. Beaumont Line Crew receives EEI Medal miniatures and Certificates from BILLY RAY CHESHIRE, whose life was saved by resuscitation. Pictured left to right are VALERY E. BLANCHETTE, A. H. SHIRLEY, H. C. SHAWVER, E. LLOYD PRIEST, G. A. GEIGER, CHESHIRE, and ROY S. NELSON, company President.

station in Santa Clara, Calif. Preparing to drill holes in one of the poles, Groundman Joseph R. Hurn plugged in an electric drill to a portable generator and pressed the starting switch. He immediately cried out and collapsed, letting go of the drill as he fell.

Sub-Foreman Peter P. Wojcik and Lineman Virgil W. Thompson, who had been rigging the generator, ran to Hurn, who was lying on his back, unconscious and not breathing. Wojcik placed the injured man in position for artificial respiration, and Thompson began treatment by the prone-pressure method. Meanwhile, Truck Driver Dewey Traylor secured a tarpaulin and extra clothing from the truck to keep Hurn warm, and Lineman Jack H. Todd ran to a nearby store to telephone for a doctor and ambulance.

After three or four minutes of resuscitation, Hurn began to breathe normally, and he regained consciousness. Todd and Traylor administered shock treatment, and the patient was made comfortable until the arrival of an ambulance about 20 minutes after the accident occurred. Hurn was then taken to the hospital, losing four days working time but suffering no permanent injury. It was determined after the accident that the wiring in the drill used by Hurn had shorted and that he had been wearing wet gloves and shoes at the time.

Virgil W. Thompson was awarded an EEI Medal and Peter P. Wojcik, Jack H. Todd, and Dewey Traylor Certificates of Assistance at a luncheon held at El Jardin Restaurant in San Francisco on March 9, 1953. Raymond W. White, Manager of the P. G. and E. Claims and Safety Department, made the presentations. John A. Britton Award Citations, established by a former P. G. and E. vice president, were also presented to Thompson, Wojcik, and Todd, as well as a letter of commendation to Traylor, by Harold F. Carr, Personnel Department Manager.

Stories of the rescue and award ceremony appeared in the *San Jose Evening News*, March 9, 1953; *Seaside News-Sentinel*, March 9, 1953; *Monterey Peninsula Herald*, March 9, 1953; *San Francisco Chronicle*, March 10, 1953; *San Francisco Examiner*, March 10, 1953; *Fresno Bee*, March 13, 1953; *Oakdale Leader-Herald*, March 12, 1953; *Amador Dispatch*, March 27, 1953; *Stockton Record*, April 1, 1953; *Oakdale Leader-Herald*, April 2, 1953; and *Amador Ledger*, April 2, 1953.

BEAUMONT LINE CREW

Gulf States Utilities Company

On the morning of July 25, 1952, Foreman A. H. Shirley and his crew had been assigned to pull the slack out of a street-light circuit in preparation for tree-trimming along Beaumont's Trinidad Street. While Helper G. C. Rutherford, Lineman H. C. Shawver, and Truck Driver G. A. Geiger were getting together the line hose and other equipment to be installed before actual work was undertaken, Lineman Billy Ray Cheshire climbed a pole which supported telephone, street-light, secondary, and primary circuits. The street-light circuit had been deenergized earlier.

Shirley was walking back to the pole from an inspection of the lines when he heard Cheshire cut out and groan. The foreman immediately gave instructions to call an ambulance and prepared to rescue Cheshire, whose right foot was on the telephone messenger, his left arm hanging over the street-light fixture. Subsequent investigation revealed that the street-light circuit was in reality energized through contact with a 4-kv conductor 1.8 miles from the scene of the accident.

Before attempts to free Cheshire's body could be made, the victim became unconscious and fell about 18 feet to the pavement, where he struck his head on a shell driveway. The crew worked together to prepare Cheshire for prone-pressure artificial respiration which Rutherford applied. Cheshire started breathing after about 30 seconds, but resuscitation was continued for approximately 45 minutes both at the accident scene and in the ambulance on the way to the hospital. During the process, Shirley relieved Rutherford, then Shawver relieved Shirley. Lloyd Priest, a Transmission and Distribution Department employee who had answered the ambulance call, also applied prone-pressure respiration at the accident scene and in the ambulance. Another service employee, Valery Blanchette, likewise responded to the radio message and came to aid the rescue attempt.

Cheshire suffered severe electrical shock, burns, lacerations, and concussion. Although his condition was critical for four weeks, he was released from hospitalization in four months.

For their successful resuscitation of Lineman Cheshire, EEI medal minia-

tures were awarded to A. H. Shirley, G. C. Rutherford, H. C. Shawver and E. Lloyd Priest. Certificates of Assistance went to George A. Geiger and Valery E. Blanchette. The awards were made at a ceremony in the Service Center in Beaumont on February 23, 1953, by Billy Ray Cheshire, whose life had been saved. G. C. Rutherford went into the armed services prior to the ceremony and thus was unable to attend. Presiding was Roy S. Nelson, President of Gulf States Utilities. A story on the presentations appeared in the *Beaumont Enterprise*.

JOSEPH DANIELS

Consolidated Edison Company of New York, Incorporated

Screams disturbed the evening quiet of Edgewater Park, N. Y., last August 28, as Joseph Daniels, an Electric Meter Tester of Consolidated Edison Co. of New York, Inc., sat in the yard of his home. Daniels then noticed people running up the street and followed them to a residence where a crowd had gathered.

There he saw a neighbor, James E. Hawthorne, applying prone-pressure to a small boy who was unconscious and not breathing. The boy, six-year-old William Goldsmith, had contacted an exposed part of a 25-foot electrical cord extending from the house, across the lawn, to a battery charger connected to an automobile. Hawthorne, who had cleared William of electrical contact with a boat oar, had been giving treatment for ten minutes, when he requested Daniels to relieve him.

While Hawthorne went to his house to secure blankets and telephone the police, Daniels continued resuscitation for about 20 more minutes before the lad showed signs of life and began to labor for breath. A few minutes later a rescue squad of the New York City Fire Department arrived and relieved Daniels by application of an inhalator. The rescue squad was followed by a Fordham Hospital ambulance, whose attendant ordered continuation of the inhalator. The boy was then removed to the hospital, remaining there for 16 days before being released as an out-patient. He suffered no permanent injury.

Modesty prevented Daniels from notifying his company of the rescue, but a letter from William's appreciative parents to H. R. Searing, President of Consolidated Edison, called attention to the incident. As a result, Daniels was presented an EEI Medal on January 8, 1953, by F. C. Shaughnessy, Distribution Operation Chief, in a ceremony described in the February, 1953, issue of *Around the System*, company employee magazine. In 1937 Daniels received the company's Meritorious Service Award for similarly saving a gas victim.

JOSEPH W. TAYLOR

Florida Power Corporation

Five miles southeast of Perry, Fla., on the afternoon of July 24, 1952, a four-man crew of the Florida Power Corp. had finished installing the third wire in two spans of secondary and was preparing to replace a pole-mounted 3-kva transformer with a 5-kva transformer.

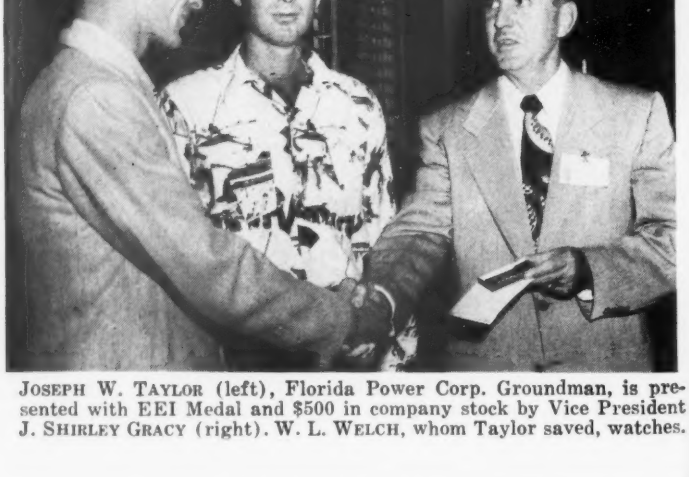
At about 3 p. m. Lineman William L. Welch positioned himself on the pole underneath the transformer, and a hot stick was sent up to him by means of a handline. As Working Foreman J. B. Dansby climbed the pole, Welch loosened the hot-line clamp on the lightning arrestor lead and handed the hot stick to his foreman, who lowered it.

Suddenly the roar of an arc was heard by crew members, and Welch started to fall from the pole. Dansby grabbed him but was unable to hold him. The lineman then plummeted 25 feet to the ground, where his head struck a fence post.

Groundman Joseph W. Taylor and Truck Driver-Helper J. H. Holmes ran to help their co-worker, whom they discovered lying on his back, unconscious and not breathing. Taylor immediately rolled Welch over and began to administer prone-pressure artificial respiration. After about four minutes of treatment, the injured man showed signs of life and within a few more minutes regained consciousness. Welch thrashed around but was finally quieted. He was then placed in a private car, driven to a doctor's office, and subsequently treated for his head wound and burns at the Memorial Hospital in Tallahassee. He was away from work for about six months.

No one saw the accident, but it is assumed that Welch had loosened his safety belt and contacted the transformer bushing with his right hand. As the switch lead was attached to the primary conductor on one side of

JOSEPH DANIELS (left), Consolidated Edison Co. of N. Y., Inc., proudly accepts EEI Medal from Distribution Operation Chief, H. C. SHAUGHNESSY.



JOSEPH W. TAYLOR (left), Florida Power Corp. Groundman, is presented with EEI Medal and $500 in company stock by Vice President J. SHIRLEY GRACY (right). W. L. WELCH, whom Taylor saved, watches.

Foreman DAVID P. ABERNETHY (center), Carolina Power & Light Co., receives EEI Medal from J. C. RICHERT, JR. (right) Vice President, as ALPHUS C. TAYLOR, Certificate of Assistance winner, watches.

FRANKLIN F. CASTLE (left) receives congratulations and an EEI Medal from MARTIN S. LUTHRINGER, President, Central Illinois Public Service Co.

the pole entirely separate from the lightning arrestor on the other side of the pole, the transformer was energized.

Joseph W. Taylor was presented an EEI Medal and $500 in Florida Power Corp. stock by Vice President J. Shirley Gracy at an annual company safety dinner held in Monticello, Fla., on January 19, 1953. William L. Welch attended the ceremony. Stories on the award appeared in *The Monticello News* on January 23, 1953, and in the February, 1953, issue of *Power Lines*, company employee newspaper.

DAVID P. ABERNETHY

Carolina Power & Light Company

On a pole near Sandy Bottom, N. C., on the afternoon of March 21, 1952, a crew of the Carolina Power & Light Co. discovered a live conductor lying against a crossarm, which had rotted in such a manner that the pin and insulator had fallen to one side. Linemen Haywood O'Neal and Alphus C. Taylor were assigned to reset the pin, and both men climbed the pole.

O'Neal positioned himself above Taylor and, while his right foot rested on a guy wire, unconsciously grasped the crossarm brace. He immediately stiffened and cried out, the brace being energized by the conductor lying on the crossarm. In order to free him of electrical contact, Taylor knocked O'Neal's foot away from the guy wire, causing him to fall to the ground.

Acting Foreman David P. Abernethy hurdled a farm fence and ran to O'Neal, who was unconscious and not breathing. While Abernethy administered prone-pressure artificial respiration, Taylor climbed down the pole and made sure O'Neal's mouth was free of obstructions. After about ten minutes of resuscitation, O'Neal regained consciousness and his breathing was restored to normal. People in an adjoining house had summoned an ambulance, and O'Neal was taken to a hospital for treatment of burns. He was away from work for about eight days.

David P. Abernethy was awarded an EEI Medal and Alphus C. Taylor a Certificate of Assistance at a ceremony held recently at the CP&L offices in Raleigh, N. C. Company personnel from the Kingston office, as well as executives from the Raleigh and Wilmington offices, were on hand to witness the presentations by Vice President J. C. Richert, Jr.

FRANKLIN F. CASTLE

Central Illinois Public Service Company

In the wake of a severe wind and rain storm, which struck Watseka, Ill., late in the afternoon of June 29, 1952, Central Illinois Public Service Co. crews set out to repair damage so widespread that personnel from outlying towns had to be summoned to assist the Watseka forces.

One of the crews was assigned repair of distribution lines on South Third Street, where a large limb had fallen across the wires, breaking off a pole. Shortly after midnight the crew temporarily reset the pole, and Lineman Forrest Gardner mounted it in order to splice two primary conductors and a street-lighting wire. He was soon joined by Lineman William H. Squibb, who was to assist him.

As Squibb belted himself to the pole, he suddenly cried out and fell 15 feet to the ground, landing upright in soft earth. He staggered backward, tripped, and then got back on his feet. Asking Meter Reader Franklin F. Castle, standing near the base of the pole, what had happened, Squibb again stepped backward and collapsed.

Apparently he had failed to see a loose end of wire hanging down from a crossarm and in belting onto the pole had received shock when he contacted the wire with the top of his right ear.

Squibb lost consciousness and his breathing stopped. Castle immediately began to administer prone-pressure artificial respiration, and after seven minutes of treatment, Squibb was able to breathe unassisted. He got up on his knees but was persuaded by his co-workers to lie still for a few minutes. He was then helped to the company truck, which conveyed him to a hospital for treatment of burns. He lost no time from work and suffered no permanent injury.

Franklin F. Castle was presented an EEI Medal for the successful resuscitation of his fellow worker by Marshall S. Luthringer, President of Central Illinois Public Service Co., at a special meeting of employees held in Paxton, Ill., on January 14, 1953. Company executives in attendance were E. F. Kelly, then Chairman of the Board; J. C. Happenny, Vice President; R. H. Thompson, Division Manager; H. J. Musgrove, Safety Supervisor, and E. H. Fultz, Chairman, Central Safety Committee.

Some Shocking Episodes in TVA History

The Mysterious Case of Section 3

HIDDEN THREADS OF HISTORY: Wilson through Roosevelt. By Louis B. Wehle. Introduction by Allan Nevins. 300 pages, $4.00. The Macmillan Co., New York.

A GENEROUS bit of the obscured story of the events and machinations that cleared the way for the transformation of TVA from a modest governmental project, ostensibly designed to provide flood control and navigation on the Tennessee River, to its present status is uncovered in this book by Louis B. Wehle. The nature of the disclosure is such that in the introduction to the book the historian, Allan Nevins, is moved to comment that "to many readers, some episodes in this story will be deeply shocking; to many also, the connection between the TVA battle and the President's court struggle . . . will be quite new."

Mr. Wehle, author of *Hidden Threads of History,* is a lawyer with a long history of public service, including distinguished work on various boards and commissions during and subsequent to the first and second world wars. His book, in the main, is a personal narrative and commentary covering many of the chief actors and events on the national scene from 1917 to the present. In his student days, Mr. Wehle was a co-editor with Franklin D. Roosevelt of the *Harvard Crimson* and maintained friendly relations with him until his death in 1945. More than half the book is devoted to the motivations, actions, and evaluations of the late President and to Mr. Wehle's personal and official relations with that controversial figure.

Four chapters, with which this review is concerned, are allotted to the TVA episodes and its corollary story of the "Court-packing" affair. The first begins with Roosevelt's early policies on Tennessee Valley water power and brings Mr. Wehle, in 1936, into the picture as mediator for a Roosevelt-proposed power pooling arrangement between TVA and the private companies, "that might serve as a model for other regions where major Federal power projects were contemplated."

The next chapter concerns episodes of the brief pooling negotiations period which seemed to have been a tentative move in a larger play, which, in retrospect, had little to do with power pooling. Begun on September 30, 1936, the pooling negotiations were abruptly terminated January 25, 1937, by the President, following a brief note to his mediator, Mr. Wehle, to the effect that he saw no use in going on with the negotiations.

In summing up this act, Mr. Wehle rejects the theory that Roosevelt's hasty abandonment of his power pooling proposal was from the outset a pre-election maneuver to mollify conservatives. But his own conclusion as to the President's motive is hardly less charitable. "In view of his fixed animus against the private power interests," he writes, "is it not more reasonable to conclude that he was willing to negotiate with the companies in September, 1936, when they were at the disadvantage in which TVA's acts had placed them, but was unwilling in January, 1937, when it seemed that the Courts might, by injunction, remove that disadvantage?"

Perhaps the most shocking incidents in the TVA story are told in the sections dealing with the TVA-Tennessee Electric Power Co. litigation involving the constitutionality of TVA.

Mr. Wehle presents circumstantial and factual evidence which, in essence, adds up to the inescapable conclusions:

1. That the court's personnel was deliberately manipulated to influence the outcome of the TVA controversy pending before it.

2. That the Congressional framers of a certain enactment (Section 3 of H.R. 2260, dropped from the Judicial Code since its use in the TVA case) knew that it would "load the chances" in favor of TVA by making mandatory the selection of judges even though they were partial to the government's side of the case, and that it was deliberately drafted for that purpose.

3. That the behind-the-scene activities in the enactment of Section 3 and in other episodes were, through inference, endorsed by the late Senator Norris and were known by, and had the blessing of, the President.

4. That the Supreme Court "packing" scheme of the President was triggered by the TVA litigation, and that during the months of the "Court-packing" battle in Congress, Section 3 was "held in reserve by Senator Norris and his co-workers for TVA either to re-enforce S. 1392's intended effect on the judicial handling of the TVA controversy, or in case of the Senate bill's defeat, at least to strengthen TVA's position in the lower court."

5. That acceptance of Section 3 was undoubtedly forced upon Congress as a compromise measure apparently deemed necessary to insure defeat of S. 1392, the Supreme Court "packing" bill.

6. That every vestige of the hearings on H.R. 2260 and its Section 3, and every trace of correspondence or memoranda relating to the bill, contrary to regular procedure, have disappeared from committee records and the National Archives.

These conclusions are reached by the reader through Mr. Wehle's recounting of the travels of the TVA controversy from one court to another. First, a district court prohibited TVA from any further activities in December, 1936, questioning its constitutionality. TVA immediately appealed to the Circuit Court of Appeals which, in May, 1937, lifted the temporary enjoinder and referred the matter of constitutionality back to the district court. Section 3 of H.R. 2260 was then put through, while the TVA case was pending, apparently to "pack" the district court with judges, one of whom had already shown partiality to TVA. This court denied the permanent injunction suit against TVA in January, 1938, saying that what TVA was doing was valid and legal. In January, 1939, the Supreme Court declined to disturb this decision and avoided dealing at all with the question of constitutionality. Thus, the point which set aflame the TVA controversy, that of the "doubt about the constitutionality of the statute," was never cleared up for reasons which Mr. Wehle discusses and speculates upon with insight and judiciousness.

Instead, the issue effectuated, in the instance of Section 3, Congressional and Administrative proceedings which, Mr. Wehle says, "violated in-

grained principles of public ethics, and even of the Constitution." "To say the least, the moves that forced through Section 3 as Federal law were less than fastidious," comments the author.

A startling eye-opener, this judicial and legislative episode discloses some of Roosevelt's standards and thinking. To him, the TVA project could be made an example of cheap power and a way to openly chastise private-power interests. In 1935 and 1936 when the Supreme Court struck down some of the Administration's emergency measures, "his Olympian, supra-Constitutional ideas about the status of the Judiciary became fixed," points out Mr. Wehle. The TVA litigation pending in 1937 "was probably the decisive stimulus for his assaults on the Federal Judiciary and its highest court. The TVA chapter was one of Roosevelt's least creditable ones."

Hidden Threads of History, a comprehensive work, is definitely a book to be read through more than once. At the completion of each successive study, the reader will be struck by the impact and import of another detail deftly woven into the story by Mr. Wehle. Throughout his discussions of issues and people, the author has maintained historical perspective and objectivity. The result, a compelling book, is an important contribution to contemporary history and is of more than passing interest to all who ponder the nation's future.—W. C.

RESEARCH RESULTS CONCERNING EARTH AS A HEAT SOURCE OR SINK

Prepared by the Joint AEIC-EEI Heat Pump Committee

THE possibility of using the earth as a heat source or sink for heat pump systems has been under increased investigation since the end of World War II. An initial report on the subject was published by the Joint Committee in the March, 1948, BULLETIN. That first report covered 12 investigations in progress or being planned at the time.

In 1949 the committee believed it would be of interest and value to report on the progress which had been made in the investigations included in the initial report. A progress report, in the form of a supplement to the 1948 article, appeared in the August, 1949, BULLETIN.

Several of the investigations included test installations as part of their physical equipment. Operating data from a group of these installations were collected and analyzed. A correlation of these operating characteristics was made by Dr. W. A. Hadley, Consultant to the Joint Committee at the time, and published in the December, 1949, BULLETIN.

Many of the initial investigations have been concluded and new ones have been initiated. Reports on their research results have been published by several of the agencies at which these investigations have been carried out. The Joint Committee believed it would be of interest if the results of these investigations could be presented in some comparable manner so that the present situation could be made known.

The tabulation on the following three pages concerns the items believed to be of interest, and also the results or conclusions noted by the respective investigators. Where possible, the data have been compared on a common base. The information as presented has been cleared by the respective author or sponsor and no overall conclusions have been made by the committee.

The following variations will be noted on closer study of the tabulated results:

1. Heat Transfer Surfaces:
   The heat transfer surfaces were of two types—horizontal tubular bundles or grids and vertical tubes or tanks. The horizontal grids varied in length from 88 to 2,200 ft., while the vertical heat transfer surfaces varied from 50-ft. monotubes to 5-ft. tanks.
2. Heat Pump Equipment:
   Compressor sizes varied from ¾ to 7½ hp.
3. Transfer Media:
   The heat transfer media circulated within the buried heat transfer surfaces included brine solution, antifreeze, F-12 refrigerant, and water.
4. Coil Temperatures:
   The operating temperatures of the heat transfer surfaces varied as follows: Heating Cycle (as evaporator), 15 to 46 F; Cooling Cycle (as condenser), 80 to 130 F.
5. Duration of Tests:
   The operating time of equipment for these investigations varied from a few hours of continuous operation to a period of five years of intermittent operation in an actual residential installation.
6. Transfer Rates:
   Transfer rates for horizontal grids were compared on a Btu/hr/ft/F base while those for vertical heat transfer surfaces were compared on a Btu/hr/sq ft/F base. During the heating cycle the heat transfer rates for the horizontal surfaces varied from 0.64 to 5.15 Btu/hr/ft/F while on the cooling cycle these rates varied from 0.64 to 1.3 Btu/hr/ft/F. During the heating cycle the heat transfer rates for the vertical surfaces varied from 1.07 to 6.72 Btu/hr/sq ft/F while on the cooling cycle this rate (based on one test) was 1.47 Btu/hr/sq ft/F.

It should be noted, however, that even with this considerable amount of information there is still no apparent workable design equation which can be used by the individual contractor. Additional research is undoubtedly required in order that this data may be resolved. A subcommittee of the Joint Committee is now endeavoring to derive a suitable design equation from operating records of several installations using ground coils.

Additional information on any of the projects included in the tabulation may be obtained by contacting the respective sponsor, information source noted, or A. T. Boggs at the Edison Electric Institute, 420 Lexington Ave., New York 17, N. Y.

Research Results Concerning Earth as a Heat Source or Heat Sink for Heat Pump Applications

INSTITUTION	PROJECT STATUS	COIL DATA	HEAT PUMP EQUIPMENT	DURATION OF TESTS HEATING	DURATION OF TESTS COOLING	TRANSFER RATE HEATING	TRANSFER RATE COOLING	RESULTS OR CONCLUSIONS	INFORMATION SOURCES	SPONSOR
Armour Research Fdn	Completed		3 hp	863 Hours				Results indicated that 3/4" OD or larger coil buried 2 or 3 ft below average frost line will serve satisfactorily, provided a sufficient length of coil and proper spacing are employed to prevent excessively low refrigerant temperatures inside coil during the heating season.	Midwest Power Conf Proc 1947, "Losses in the Cycle of a Heat Pump Using a Ground Coil" R A Budenholzer	Terre Temp Co, Indianapolis, Ind
Univ of Connecticut	Completed	Coils approx 150' long, copper. A-7/8" OD at 6' depth B-7/8" OD at 6' depth C-1 3/8" OD at 8' depth D-7/8" OD at 6' depth E-two coils 7/8" OD at 6' depth, in series F-two coils 7/8" OD at 6' depth, in parallel	1 hp compressor; F-12 circulated in ground coils. AVE TEMPS Evap / Ground A - 30.0 / 43.6 B - 21.0 / 41.8 C - 15.5 / 41.7 D - 15.0 / 47.0 E - 38.4 / 51.8 F - 40.7 / 57.3	A - 645 hrs B - 557 hrs C - 600 hrs D - 719 hrs E - 787 hrs F - 659 hrs		Btu/Hr/Ft F A - 2.29 B - 2.61 C - 2.10 D - 1.70 E - 2.43 F - 2.25		Direct expansion without auxiliary transfer fluids seemed most favorable. Soil properties necessary for proper design. Moist soil superior to dry. Six ft depth appeared reasonable for ground coil southern New England. Intermittent operation would probably increase heat absorption rate over steady state absorption	"The Residential Heat Pump in New England" C H Coogan, Jr, 1948	Conn Light & Power Co American Brass Co Connecticut Power Co Hartford Elec Lt Co
Kansas State College	Completed	Two 100' sections 1.125" OD copper buried at 6' depth. U-shaped coils one with legs 10' apart and other with legs 2' apart. Latter coil in single 50' trench.	3 hp compressor	A-Dec-Jan '48-'49; 750 hrs; 2' spaced coil; 6' deep; water at 35F; Sandy soil. B-Apr '49, 339 hrs; 2' coil; brine circulated; pipe temp 21F. C-Mar-Apr '49, 422 hrs 10' spaced coil; brine; pipe temp 21F	648 hours starting Aug 23, 1949; 10' spaced coil.	Btu/Hr/Ft F A-For 400 hrs steady operation, ave 1.68 B-For 400 hrs steady operation, ave 1.83 C-For 400 hrs steady operation, ave 2.42	Average rate of heat dissipation for 400 hrs 1.3 Btu/Hr/Ft F	After heating test, indicated that moisture content was twice as much as 6" from pipe at 6' depth as that at 18" from pipe. Heat dissipation rate considerably less than heat absorption rate. Heat absorption rate high initially but decreases to stable level; heat dissipation high initially, reduced steadily with increasing time of steady heap pump operation.	"Thermal Properties of Soil" J W Funk, Nov '49	Kansas CREA
U S Dept of Agriculture, Kansas State College	Completed	This project was aimed at the development of laboratory equipment satisfactory for the measurement of heat flow, thermal conductivity, and moisture migration in soils (2' diam soil drum with central heat exchanger, water jacket, end guards and necessary instrumentation). Temperature of heat exchanger and sink capable of variance over normal existing range. Lab techniques and specific heat measurements also perfected.						Measurements made with equipment were satisfactorily duplicated in successive tests.	U S D A Report	U S Dept of Agriculture
U S Dept of Agriculture, Kansas State College	In Progress	Two 50' copper tubes 1 1/8" OD in separate trenches 6' deep. Clay soil.	Two 3/4 hp compressors F-12 circulated in coil. Ave Evap Temp 1. 35F 2. 20F	This project concerns intermittent heat removal from soil in accordance with degree day requirements for heating. This is to arrive at a generalized formula for intermittent heat flow for this locality.				Report to be made after conclusion of heating season. Part of effort to correlate with similar data taken at other locations.	Special report to Committee	U S Dept of Agriculture and Kansas C R E A
Kansas State College	Completed	Four copper coils, each 50' long, 1 1/8" OD, 6' deep. Refrigerant flows out thru 3/8" tube and returns in annular space between 3/8" and 1 1/8" tubes -- simulates line heat source and sink. Two coils in clay backfill, two in sand backfill. Backfill extends 1' in all directions from coils.	Four 3/4 hp compressors. Direct expansion and condensation of F-12 in buried coils.	A - 506 hrs continuous operation of two coils. Pipe temp: Sand - 16.4F Clay - 17.2F B - 670 hrs continuous operation of four coils. Pipe temp: (1) Sand - 15.8F (2) Sand - 20.8F (1) Clay - 17.3F (2) Clay - 20.0F	C - 223 hr continuous operation of two coils. Pipe temp: Sand - 110.4F Clay - 110.0F D - 195 hrs continuous operation of four coils. Pipe temp: (1) Sand - 110.0F (2) Sand - 110.5F (1) Clay - 111.4F (2) Clay - 110.0F E - 243 hrs continuous operation of two coils at three temperatures: (1) Sand - 100.0F (2) Sand - 110.2F (3) Sand - 119.9F (1) Clay - 100.0F (2) Clay - 109.8F (3) Clay - 120.0F	Btu/Hr/Ft F A - Sand - 0.88 Clay - 1.50 B - (1) Sand - 0.96 (2) Sand - 1.16 (1) Clay - 1.31 (2) Clay - 1.41	Btu/Hr/Ft F C - Sand - 0.79 Clay - 1.14 D - (1) Sand - 0.70 (2) Sand - 1.22 (1) Clay - 0.77 (2) Clay - 1.23 E - (1) Sand - 0.75 (2) Sand - 0.70 (3) Sand - 0.64 (1) Clay - 0.72 (2) Clay - 0.71 (3) Clay - 0.69	Variations in heat flow within each soil type are greater than differences attributable to soil type. In general, higher heat transfer was related to clay on heating cycle with smaller margin on cooling cycle.	Special report to Committee	U S Dept of Agriculture and Kansas C R E A
				G - 1634 hrs cycling 6 hr "On" and 6 hr "Off" with pipe temp 30F. Followed by continuous operation at 30F. Then cycling 6 hr "On" and 6 hr "Off" with pipe temp 20F. Cycling 4 hrs "On" and 6 hrs "Off" followed by continuous operation at 20F. Then 6 hr cycling followed by continuous operation at 10F. Two coils, sand and clay.	F - 650 hrs cycling with 6 hrs "On", 6 hrs "Off". Two coils, sand and clay, 110.0 F.	G - 30F, 6 hr cycles Sand - 1.69 Clay - 1.25 30F, Continuous Sand - 0.94 Clay - 0.66 20F 6 hr cycles Sand - 1.24 Clay - 1.20 20F 4 hr cycles Sand - 1.50 Clay - 1.09 20F Continuous Sand - 0.92 Clay - 0.96 10F 6 hr cycles Sand - 1.62 Clay - 1.45 10F Continuous Sand - 1.01 Clay - 1.31	F - Sand - 1.15 Clay - 1.21	Values for cycling operation are based on "average heat flow" during "On" part of cycle. Temperatures of sand surrounding pipe went lower than clay at end of "On" cycle but recovered to higher temperature at end of "Off" cycle. Showed some advantage for sand in cycling type operation.		
Univ of Kentucky	Completed	Steel casing 1 1/4" OD, 6' deep. Coil of 1/4" OD copper tubing inside casing. Coil 4' long, 3" diam. Backfilled with sand.	3 hp heat pump with 1/4" OD copper tubing in casing.	Ave Coil Temp A - 30F B - 20F C - 10F D - 0F		Btu/Hr/Ft F A - 1.0 B - 0.9 C - 0.8 D - 0.7		Intermittent heating test; from 4 am to 8 am. Heat pump operated 4 hrs, off 4 hrs.	Expt Evap Sta Bulletin	Kentucky Utilities Co

Univ of Kentucky	Completed	480' copper 1 1/8" OD pipe buried at 4.5'.	5 hp heat pump unit; antifreeze circulated in ground coil.	A-Nov 29.8 F B-Dec 27.9 F C-Jan 25.6 F D-Feb 20.9 F E-Mar 19.6 F F-Apr 19.1 F	—	Btu/Hr/Ft F A - 1.09 B - 1.19 C - 1.73 D - 1.27 E - 1.24 F - 1.10	—	Intermittent heating test; from 6 pm to 6 am daily. Ave strength of entire heat source of 489', 27.5 Btu/hr/ft; LINE source, 47.6 Btu/hr/ft; GRID source, 16.6 Btu/hr/ft.	Engr Exp Sta Bulletin "Earth Heat Pump Research Part II", Vol 9, No. 2, Dec 1950.	Kentucky Utilities Co Engr Exp Sta
Univ of Kentucky	Completed	489 copper 1 1/8" OD pipe buried at 4.5'.	3 hp heat pump unit; antifreeze circulated in ground coil during July and part of August, water circulated from Aug 13 to end of test.	—	A-July 114.2 F B-Aug 120.3 F C-Sept(½) 122.3 F D-Sept(½) 119.6 F	—	Btu/Hr/Ft F A - 0.73 B - 0.66 C - 0.64 D - 0.99	Rainfall 30% above normal. Unit operated intermittently from 6 am to 6 pm daily. No appreciable increase in heat transfer from coil to soil when water replaced prestone solution as heat transfer medium. Believed earth is suitable heat sink as well as heat source.	Trans of Ky Academy of Science, "Performance of an Earth Heat Pump Operating Intermittently on the Cooling Cycle" E R Penrod, R C Thornton.	Kentucky Utilities Co Engr Exp Sta
So Research Institute, Birmingham, Ala	Completed	180' copper 1 1/4";Red Clay; coil 2' depth.	Hot water pumped through coil.(heat sink)	—	8 days continuous circulation of hot water	—	9000 Btu/Hr; 1.25 Btu/Hr/Ft F	Indicated that nearly 800' of 1-1/4" OD pipe would be rbquired for a 3 ton unit under test conditions.(Orange red clay). Horizontal pipes should be spaced 4 or more feet apart.	SRI Rpt "Preliminary Tests on Heat Transfer to Ground from Buried Horizontal Pipes", '47	Southeastern Electric Exchange
So Research Institute, Birmingham, Ala	Completed	8 tanks 20" dia, 5' long buried upright 9' deep on 6' centers.	1½ ton water-to-air heat pump unit.	13 days (inlet water temp 38.5 F) Ave dT = 22F	7 days (inlet water temp 100 F) Ave dT = 46F	5338 Btu/Hr (1.07 Btu/hr/sq ft F)	13500 Btu/Hr (1.47 Btu/hr/sq ft F)	Vertical tanks as source of heat or as heat sink for heat pump are considerably less efficient from standpoint of heat transferred per unit area than smaller pipe.	SRI Rpt "Tests on Heat Transfer of Buried Vertical Tanks", '48	Southeastern Electric Exchange
So Research Institute, Birmingham, Ala	Completed	Lab test; small copper U-tubes in 400 ml beakers.	Hot water (120 F) circulated.	—	14 days (inlet water temp 120 F)	—	—	Sand always maintained contact with tubes. Clay be cheapest solution. Bentonite and oil mixture exhibited good characteristics for use where heat dissipation is required.	SRI Rpt "An investigation of Bentonite and Hygroscopic Materials as Fills for Heat Pump Ground Coils", '48	Southeastern Electric Exchange
So Research Institute, Birmingham, Ala	Completed	Two 88' copper 1 1/8" OD at 3' depth in separate trenches. One buried in Red Clay; one covered with 6" sand before refill of Red Clay.	3/4 hp pump.	Tests at 34F,22F&16F refrig temp in coil. A=Sand, 34F, 200 hrs B-Clay, 34F, 200 hrs C-Sand, 22F, 200 hrs D-Clay, 22F, 200 hrs E-Sand, 16F, 200 hrs F-Clay, 16F, 200 hrs	Tests at 80F, 90F & 100F Refrig temp in coil. (1) Clay, 80F, 50 hrs (2) Sand, 80F, 50 hrs (3) Clay, 90F, 200 hrs (4) Sand, 90F, 200 hrs (5) Clay, 100F, 200 hrs (6) Sand, 100F, 200 hrs	Btu/Hr/Ft F A - 2.55 B - 2.15 C - 3.75 D - 3.25 E - 5.15 F - 3.45	Btu/Hr/Ft F (1) 1.25 (2) 1.10 (3) 1.05 (4) 0.80 (5) 1.10 (6) 0.80	Sand is superior in picking up heat, while clay is superior in dissipating heat.	SRI Rpt "Comparative Performance Tests on Clay and Sand Fills Around Buried Pipes", '49	Southeastern Electric Exchange
Univ of Tennessee	In Progress	Electrical analogy	Square wave pulse generator to simulate intermittent operation.	Results indicate that temp drop attained after operating several hundred hours is very nearly the same for intermittent as for continuous operation. Pipe temperatures for below freezing are required unless excessively long pipe is used.					"Some Practical Aspects of Use of Earth as a Heat Source," G H Hickox, Engr Exp Sta, Univ of Tenn.	T V A
Univ of Tennessee	Completed	Research project established in April 1948 to study the possible use of buried pipes as a heat source or sink for residential heat pumps. A limited soil testing program was established as one phase of the research. This included: (1) experimental determination of the thermal conductivity and thermal diffusivity of typical soils in the Tennessee Valley area, (2) study of the effect of moisture on the thermal properties of the soils, and experimental determination of variations in natural moisture content, and (3) related study of the seasonal fluctuations of soil temperatures at various depths.						The tests indicated that thermal properties may be correlated with liquid and plastic limits and moisture content.	Engr Exp Sta Bulletin 15, June 1951, "Soil Temp, Moisture Content, and Thermal Properties" by C L Carter	Electrical Development Branch, T V A
Texas A & M Research Fdn, College Sta, Tex	Continuing	160' copper U-shaped loop ¾" OD at 5' depth. U legs 75' long, 10' apart. 1" and 2" loops also.	Brine sol'n used.Heated with elec for cooling tests. Cooled by 5 hp refrig equip for heating tests.	Max. Min. Ave 41 Days 5 11.7 Inlet Temp = 20-46F	Max. Min. Ave 42 Days 6 14.3 Inlet Temp = 100-130 F	Btu/Hr/Ft F Max Min Ave* 1.26 0.69 0.84 *Ave of Averages for ¾", 1" and 2" coils.	Btu/Hr/Ft F Max Min Ave* 1.59 0.43 0.91 *Ave of Averages for ¾", 1" and 2" coils.	A tentative coil design equation and design procedure were developed. A new soil thermal conductivity measurement method was devised; termed the heat meter method. Believed this method accounts satisfactorily for moisture migration. In general design moisture content will be higher than natural moisture content for heating coil design and lower for cooling coil design. Difference between design and natural moisture content is less for soils with high percentage clay sizes than for soils with high percentage coarser grain-sizes.	Special reports to Joint Committee	Tex Elec Service Co
Texas A & M Research Fdn, College Sta, Tex	Continuing	This project concerns natural soil temp and natural soil moisture content. Temp at 2", 1', 2', 3', 4', 5', 6', 8', 10' and air temp recorded continuously. Natural soil moisture contents are taken weekly at one foot intervals to a depth of 10'. These measurements are in their third year.							Special reports to Joint Committee	Tex Elec Service Co
Texas A & M Research Fdn, College Sta, Tex	Continuing	This project determines thermal conductivity of soils over range of moisture contents and densities of interest in buried coil design. Soils tested are classified into the Casagrande system and are representative of the kinds of soils likely to be encountered at buried coil sites.							Special reports to Joint Committee	Tex Elec Service Co
Texas A & M Research Fdn, College Sta, Tex	Continuing	This project studies thermal moisture migration and correlates the moisture content-temperature data from the buried coil tests of Project 1, from the natural soil observations of Project 2, and from the thermal conductivity specimens of Project 3. Purpose of this project is to develop a means whereby a design moisture content can be determined from knowledge of natural moisture content at coil depth and maximum change in soil temperature which will occur during coil operation. Design moisture content will be used to select corresponding soil thermal conductivity design values from the work of Project 3.							Special reports to Joint Committee	Tex Elec Service Co
Utilities Research Commission	Completed	2 coils, 155' copper 1 5/8" OD in loop 70'x 10' at 2' and 6' depths	3 hp compressor; F-12 circulated.	Operated intermittently during each day from Oct 1, 1947 to May 31, 1948 simulating a heating cycle whenever the mean air temp was less than 65F.	—	A minimum value of 40 Btu/hr/ft at 6' depth; 20 Btu/hr/ft at 2' depth. 6' - 1.7 Btu/hr/ft F 2' - 1.4 Btu/hr/ft F	—	A heat pump can be used successfully as a means of space heating in the Chicago area, and by using a buried pipe system the earth can serve as a source of heat. Results indicate that the required ground area can be obtained in the larger home building lots for burying an earth coil.	Info submitted to Joint Committee	Commonwealth Ed Co & Affiliated Cos
Univ of Washington	Completed	180' ¾" copper buried 2' depth.	F-12 circulated	Hrs Continuous Operation A- 4.25 B- 24.50 C- 72.70 D- 125.70 E- 148.10 F- 174.2 G- 192.0	—	Btu/Hr/Ft F A - 1.7 B - 1.5 C - 1.5 D - 1.6 E - 1.5 F - 1.5 G - 1.6	—	System should be designed so that maximum possible tubing will be carrying wet gas.	"Quarterly Progress Rpt Bonneville No. 3, Exp Sta No. 9- results from Tests No. 1 and No. 2.	Bonneville Pwr Adm

INSTITUTION	PROJECT STATUS	COIL DATA	HEAT PUMP EQUIPMENT	DURATION OF TESTS		TRANSFER RATE		RESULTS OR CONCLUSIONS	INFORMATION SOURCES	SPONSOR
				HEATING	COOLING	HEATING	COOLING			
Univ of Washington	Completed	5 coils 4' deep, 1" O copper; 1 coil 4' deep 3/4" OD copper; 1 coil 8' deep 1" OD copper; 1 coil 8' deep 1/4" OD copper.	2 hp compressor; F-12	———	———	———	———	Rate of heat flow is function of tube diameter, tube surface conditions, soil and refrigerant temperatures, and soil characteristics. Results indicated average city water supply would be adequate to support homes usually built on them.	Engr Exp Sta Reprint No. 37. "Factors Useful in Ground Grid Design for Heat Pumps", G S Smith. Jan 51	Bonneville Pwr Adm
Ohio Power Co	Completed	A-Vertical monotube piles one 50', two 40' long. Area total 182.3 sq ft. B-10 3/4" tube bundle, buried horizontally 5' deep; 200' tubing 1¼" steel pipe; 1/4" steel plate fins; total surface area 518 sq ft. C-Five 20' lengths 2" iron pipe buried vertically; 1" pipe concentric with 2"; liquid entered thru 2" pipe. Total surface area 62.5 sq ft.	7½ compressor	A-182.3 sq ft (1) 6 hrs, ground 53F, coil 41 F (2) 2 hrs, ground 53F, coil 39F B-518 sq ft (1) 74 hrs, ground 47F, coil 35F (2) 24 hrs, ground 47F, coil 33 F (3) 288 hrs, ground 47F, coil 18F C-62.5 sq ft (1) 3 hrs, ground 47F, coil 31 F (2) 1-14 days, ground 47F, coil 25F	———	A - 182.3 sq ft (1) 5.98 Btu/hr/sq ft F (2) 2.56 Btu/hr/sq ft F B - 518 sq ft (1) 1.75 Btu/hr/sq ft F (2) 4.46 Btu/hr/sq ft F (3) 3.08 Btu/hr/sq ft F C - 62.5 sq ft (1) 6.12 Btu/hr/sq ft F (2) 3.7 Btu/hr/sq ft F	———	Test results indicated extended surface, as used in "A" and "B", do not improve the heat transfer between the refrigerant and ground, and consequently cannot be justified.	American Gas & Elec Serv Corp Rep No 679, Sept 30, 1948, "The Earth as a Heat Sink and a Heat Source for Heat Pumps."	American Gas & Elec Serv Corp
Philadelphia Elec Co	Completed	A-3 loops 1¼ pipes parallel on 15" centers at 5' depth. 210 lin ft. COILS IN SERVICE 1948 - 1949 Date Loops T/Pipe 10/7-12/21 2 1400 12/21-1/7 3 220 1/7-4/15 3 770 4/15-5/30 2 1400 1949 - 1950 10/15-3/7 1 770 B-3 loops 1¼" pipes paralleled on 15" centers at 5' depth. 1390 lot. COILS IN SERVICE 1948 - 1949 Date Loops T/Pipe 10/7-3/7 2 860 3/7-4/15 1 450 4/15-5/30 2 860 1949 - 1950 10/15-11/15 2 45.0 11/15-3/7 1 45.0	A-5 hp package unit 1948-49 season, replaced by 7½ hp for 1949-50 season. 283 gal glycol solution. B- 5 hp package unit heat pump. 210 gal glycol solution.	Installations A & B Oct 7, 1948 - May 30, 1949 Oct 15, 1959 - May 7, 1950	———	Installations A & B Max rate of heat withdrawal observed: 40 Btu/hr/ft with coil temp 27F and temp diff between coil and ambient soil 33F. 1.1 Btu/hr/ft F above freezing. 1.3-1.8 below freezing.	———	Installations A&B Average rate of extraction with coil above freezing was 1.1 Btu/hr/ft F; with coil below freezing, rate varied from 1.3 to 1.8 depending upon geometry of coil and temp differential between coil and ambient earth.	"Residential Heat Pump Experiments in Philadelphia", three papers presented at ASEE Geol Mtg Jan '52.	Philadelphia Elec Co
Union Elec Co of Mo	In Progress	1600' of 1 1/4" OD iron pipe formed into 10 vertical loops 160 ft to 18 ft spaced 10' apart	7½ hp 2-speed compressor; non-freezing liquid circulated.	--- 1 yr, complete heating & cooling cycle ---		To be determined	To be determined	———	Special report to Joint Committee	Union Elec Co of Mo
Union Elec Co of Mo	Completed	1600' of 1 1/4" OD copper horizontal; 800' serpentine trench; arranged to use 1/4:1/2, 3/4, or all of coil.	7½ hp; non-freezing liquid circulated.	--- Has operated 5 yrs for both heating and cooling during one winter and summer one-half of coil was used.		Max based on observation estimated 30-40 Btu/hr ft of pipe	———	800' of coil found sufficient to heat home in St Louis climate with heat loss approx 60,000 Btu/hr. Of this 40,000 Btu/hr were extracted from ground.	Special report to Joint Committee	Union Elec Co of Mo
Union Elec Co of Mo	Completed	900' of 7/8" OD copper horizontal; 4' deep in 450' of trench; 6 loops each 150' long; each loop separately valved. 600' coil used in test.	3 hp; refrigerant circulated.	17,000 hrs continuous heat extraction ending in August 1952.	———	Estimated 35-40 Btu/hr/ft effective for heating operation at 150 gauge suction press and 1200 discharge.	———	600' coil found sufficient to balance compressor output. Results showed oil return can be accomplished if velocity is high enough and each loop is held to 1½ gauge. Indicated that direct expansion of refrig in ground coil is practical.	Special report to Joint Committee	Union Elec Co of Mo
Union Elec Co of Mo	In Progress	Same as 3 roject above bur coils at 30" level. Will operate 1 yr at which time report will be prepared.	———	--- 1 year ---	———	———	———	Report to be made after 1 year operation.	Special report to Joint Committee	Union Elec Co of Mo
Wisconsin Elec Pr Co	Completed	Twenty 10' iron 1" pipes buried vertically; baffled to form U tube; pipes 9'3" apart in shape of rectangle; connected by 1/4" pipes.	3 hp	A-2984 hrs, Oct '48-June '49 B-2988 hrs, Oct '47-June '48 Water circulated as heat transfer medium.	———	A - 98.4 Btu/hr sq ft based on vertical pipe surface only. B - 99.3 Btu/hr sq ft based on vertical pipe surface only. (See Results)	———	Heat extraction from the ground units per 1000 lineal feet per ft of exposed 1/4" pipe was about 1.2 Btu/hr but did rise to over 1.5 Btu/hr while freezing was taking place. Was believed that better results would be obtained by using 20 or 25 lengths of pipe to reach higher temp heat source.	"Ground as a Source of Heat for Heat Pump Operation" 1949, O O Wagley, Wis Elec Pr Co report.	Wisconsin Elec Pr Co
									JOINT AEIC-EEI HEAT PUMP COMMITTEE JULY 1, 1953	

Personals

Edwin Vennard, Vice President, Middle West Service Co., has been elected President of the company, succeeding retired **K. D. Carpenter. Rodman McClanahan,** Vice President since 1950, has been elected Executive Vice President.

Mr. Vennard, a graduate of Tulane University, has been with the Middle West Service Co. for almost 20 years and has served as a consultant on rates, economics, new business, public and employee relations, and advertising. Before joining Middle West Service, he worked for a year in the General Electric Co. Testing Department and, later, for Gulf States Utilities Co. His next position was that of general commercial manager in charge of sales and rates for Southwestern Gas & Electric Co. Mr. Vennard continues as a member of the Board of Directors and the Executive Committee.

Mr. McClanahan, also a member of the Board of Directors and the Executive Committee of Middle West Service, has been with the company since its organization except for eight years during which he was vice president of United Public Utilities Corp. His consulting capacities cover financing, taxes, accounting system procedures, and related matters.

D. E. Stultz, Vice President in Charge of Commercial Operations, The Potomac Edison Co., has been appointed Executive Vice President of the company.

Mr. Stultz has been with the company and its affiliates since 1919 when he started with the Hagerstown and Frederick Railway. In 1932 he became general commercial manager of the Potomac Edison System and in 1937 was elected commercial vice president.

In other changes, **S. S. Bradford,** Promotional Manager, was named General Commercial Manager. **Charles D. Lyon,** Advertising and Publicity Manager, was elevated to Promotional Manager, and **Charles Morrison,** Relay Engineer, was designated to fill the newly created position of Planning Engineer for the Operating Department.

MR. VENNARD

Walter J. Lyman, Section Engineer and Manager, Planning and Development Department; **Ralph R. Parkman,** Assistant to the Chairman of the Board; and **Carroll T. Sinclair,** Chief Engineer in charge of Engineering and Construction, have been elected Vice Presidents of Duquesne Light Co.

Mr. Lyman, a Carnegie Institute of Technology graduate, has been with Duquesne Light since 1924. Mr. Parkman graduated from the University of Maine and joined the company in 1926. Mr. Sinclair graduated from Lehigh University and has been with Duquesne since 1925.

Edward H. Hegmann has been elected controller of the company. He entered its employ in 1937 and has served as general auditor since 1946.

Announcement of changes among executive personnel in the Engineering Department of Pioneer Service & Engineering Co. includes the advancement of **E. D. Uhlendorf,** Senior Vice President in Charge of Engineering for 26 years, to Vice President and Consultant, and **Warren C. Drummond,** Vice President and Chief Engineer, to Vice President in Charge of Engineering, succeeding Mr. Uhlendorf.

Noah C. Pearcy, Chief Electrical Engineer, has become Chief Engineer, succeeding Mr. Drummond, and **Henry L. Hoeppner,** Senior Electrical Engineer, has become Chief Electrical Engineer.

Amasa C. Bull, Vice President, has retired as head of the Purchasing Section to take on special assignments. He has been succeeded as Chief Purchasing Engineer by **Eugene V. Cullen.**

W. D. Virtue, Vice President and Secretary, Public Service Co. of Colorado, was elected Treasurer of the company to fill the vacancy created by the retirement of **D. G. Guiney,** treasurer for 45 years. At the same time, **H. A. Mitchell,** Assistant Secretary and Assistant Treasurer, was elected Secretary to fill the opening left by Mr. Virtue's advancement. Mr. Virtue is chairman of the EEI Accounting Division Executive Committee.

Eldred H. Scott, Assistant Controller; **Arthur E. Bush,** Statistician; and **Russell G. Vernon,** Assistant Secretary, The Detroit Edison Co., have been appointed Controller, Assistant Controller, and Assistant Treasurer, respectively. Mr. Vernon will retain his position as assistant secretary in addition to becoming assistant treasurer.

Mr. Scott, a 1924 graduate of the University of Michigan, started with Detroit Edison's Construction Department the same year. In 1925 he went to Control, rising to statistician in 1941 and assistant controller in 1949. He is a former president of the American Statistical Association, former chairman of EEI Statistical Committee, and a member of the American Marketing Association, National Association of Cost Accountants, and the Research Committee of the Detroit Regional Plan Commission.

Mr. Bush joined the company in 1926 and after varied experience, including service as a field engineer's assistant and a personnel assistant, joined the Statistical Divison, where he was named statistician in 1949. He graduated from the University of Detroit.

Mr. Vernon was put in charge of Detroit Edison's New York office in 1936 when he was named assistant secretary. He was educated in Windsor, Ontario, and began with the company in the Meter Department in 1913. In 1925 he was transferred to the Audit Department where he worked until his New York appointment.

Lemore W. Clark, General Superintendent of the Underground Lines Department, The Detroit Edison Co., has been appointed Assistant Manager of Operations.

Mr. Clark, with Detroit Edison for 25 years, has held the position he just vacated since 1949. He is a fellow of the American Institute of Electrical Engineers, a member of the American Welding Society, the Engineering Society of Detroit, and the EEI Transmission and Distribution Committee.

Frank C. Marschner succeeded Mr. Clark as General Superintendent of the Underground Lines Department. He joined the company in 1920 and is a member of the Engineering Society of Detroit.

Benjamin Bennett, Assistant Secretary, West Penn Power Co., has been elected Secretary of the company to succeed **G. E. Murrie** upon the latter's retirement. Mr. Bennett has been assistant secretary since 1949 and has been with the company for 29 years.

Mr. Murrie became secretary in 1926. He joined West Penn in 1906 at Connellsville, later transferring to Pittsburgh, and in 1935, was elected director of both West Penn Power and Railways Companies.

Walter E. Beckjord has been elected Secretary of The Cincinnati Gas & Electric Co., succeeding **George F. Brenner.** Mr. Beckjord, a Yale Law School graduate and Ohio State Bar member since 1949, was formerly associated with the firm of Peck, Shaffer & Williams, company counsel.

After being with the company for 35 years, Mr. Brenner relinquished secretaryship because of ill health. He became CG&E's secretary and a vice president in October, 1943.

J. Henry Jacobs, Sales Coordinator, Pennsylvania Power & Light Co., has been appointed Assistant General Sales Manager.

Having attended Penn State College classes, majoring in mining engineering and business administration, Mr. Jacobs joined the Harwood Electric Co., a predecessor company of PP&L, in 1916 as a surveyor. He later entered military service in World War I and worked for various companies before returning to Pennsylvania Power & Light in 1928 as power sales engineer in Allentown, Pa. He became industrial engineer in 1936, was advanced to system sales representative in 1939, and system customer supervisor in 1941. He was promoted to field sales coordinator in 1946 and sales coordinator four years later.

James A. Lewis, Assistant Superintendent of Western Massachusetts Electric Co.'s Springfield Meter Department since 1951, has succeeded **Merton B. Dexter** as Superintendent. Mr. Dexter retired recently after serving the company for 42 years.

Mr. Lewis was born in Wyoming, Pa., and received his schooling in Springfield, Mass. He came to the company in 1925 as a meter reader.

Louis E. Davis has been appointed Director of Purchases of Virginia Electric and Power Co. and is to be in direct charge of all purchasing activities of the company.

Mr. Davis was simultaneously for six years assistant superintendent of production and supervisor of steam station design engineering at Vepco. He recently returned from Washington, D. C., where for 16 months he had been on leave to the Department of the Interior, serving as engineering consultant to the Defense Electric Power Administration.

H. L. Klein, Assistant Treasurer, Ebasco Services, Inc., has been appointed Treasurer and Assistant Secretary. He joined Ebasco in 1939 after being employed by Associated Gas & Electric Co.

G. P. Redden, also Assistant Treasurer of the firm, was appointed General Construction Auditor. Mr. Redden, previously employed by Stone & Webster Corp., has been with Ebasco since 1921.

Gaylord B. Buck

GAYLORD B. BUCK, Vice President and General Commercial Manager, Public Service Co. of Colorado, passed away at the age of 59 in a Denver, Colo., hospital following a short illness. He had been a prominent

MR. BUCK

Denver resident, known there and across the state as a dynamic personality who pioneered and stimulated the extension of electric service to communities in the major portion of Colorado.

Mr. Buck had been active in the electric industry since 1909 when he was employed by the Public Service Co. of Mt. Vernon. He joined the Public Service Co. of Colorado in 1924 as sales manager and became general commercial manager in 1928, a member of the board of directors in 1932, vice president in 1937, and vice president and general commercial manager in 1943.

He was born at Mt. Vernon, Ill., on September 30, 1893, and attended schools there. He married Blanche Underwood in 1915. Surviving him are his widow; two sons, Gaylord B., II, and William C.; a daughter, Mrs. Blanche Buck Owens; his mother, Mrs. C. F. Buck; a sister, Mrs. Robert C. Holsworth; and five grandchildren.

Active in civic and social activities, Mr. Buck had been a member of the Denver Athletic Club, Denver Country Club, Denver Press Club, Lakewood Country Club, Gyro, Chamber of Commerce, Sales Managers' Council, Park Hill Lodge No. 148, AF&AM, Scottish Rite, and Shrine. He also had been a member of the Rocky Mountain Electrical League, having served as president in 1934, 1935, 1941, and 1943. He won the Mc-Graw-Hill national award for cooperation in the electric industry in 1934 and had been a member of the EEI Commercial Division General Committee for a number of years.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

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(Terms Expiring 1954)

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(Terms Expiring 1955)

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(Terms Expiring 1956)

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JOSEPH M. BELL, JR.....New York State Electric and Gas Corp., Binghamton, N. Y.
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EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

(Continued)

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Coordinator of Customer Activities, J. GORDON ROSS.....Rochester Gas and Electric Co., Rochester, N. Y.
Customer Accounting, G. F. HIGGINS.....The Detroit Edison Co., Detroit, Mich.
Customer Collections, T. C. EICKMEYER.....The Dayton Power and Light Co., Dayton, Ohio
Customer Relations, C. J. BERNER.....Wisconsin Electric Power Co., Milwaukee, Wis.
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Taxation Accounting, S. J. SCHIML.....The Dayton Power and Light Co., Dayton, Ohio

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Residential Section, R. J. MILLER.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
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Transmission and Distribution, J. W. ANDERSON.....Philadelphia Electric Co., Philadelphia, Pa.

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Area Development, W. I. DOLBEARE.....Virginia Electric and Power Co., Richmond, Va.
Atomic Power, EDGAR DIXON.....Middle South Utilities, Inc., New York, N. Y.
Codes and Standards, A. H. KEHOE.....Consolidated Edison Co. of New York, Inc., New York, N. Y.
Electric Power Survey, WALKER L. CISLER.....The Detroit Edison Co., Detroit, Mich.
Financing and Investor Relations, R. N. BENJAMIN.....Stone & Webster Service Corp., New York, N. Y.
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Insurance, W. O. RANDLETT.....Virginia Electric and Power Co., Richmond, Va.
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Membership, E. S. THOMPSON.....The West Penn Electric Co. (Inc.), New York, N. Y.
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Rate Research, I. L. CRAIG.....Philadelphia Electric Co., Philadelphia, Pa.
Statistical, W. W. GODARD.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
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